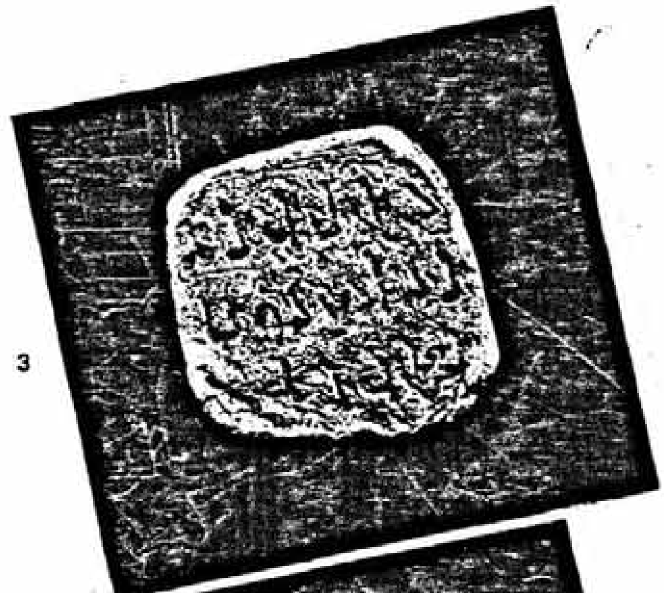
Indian Archaeology

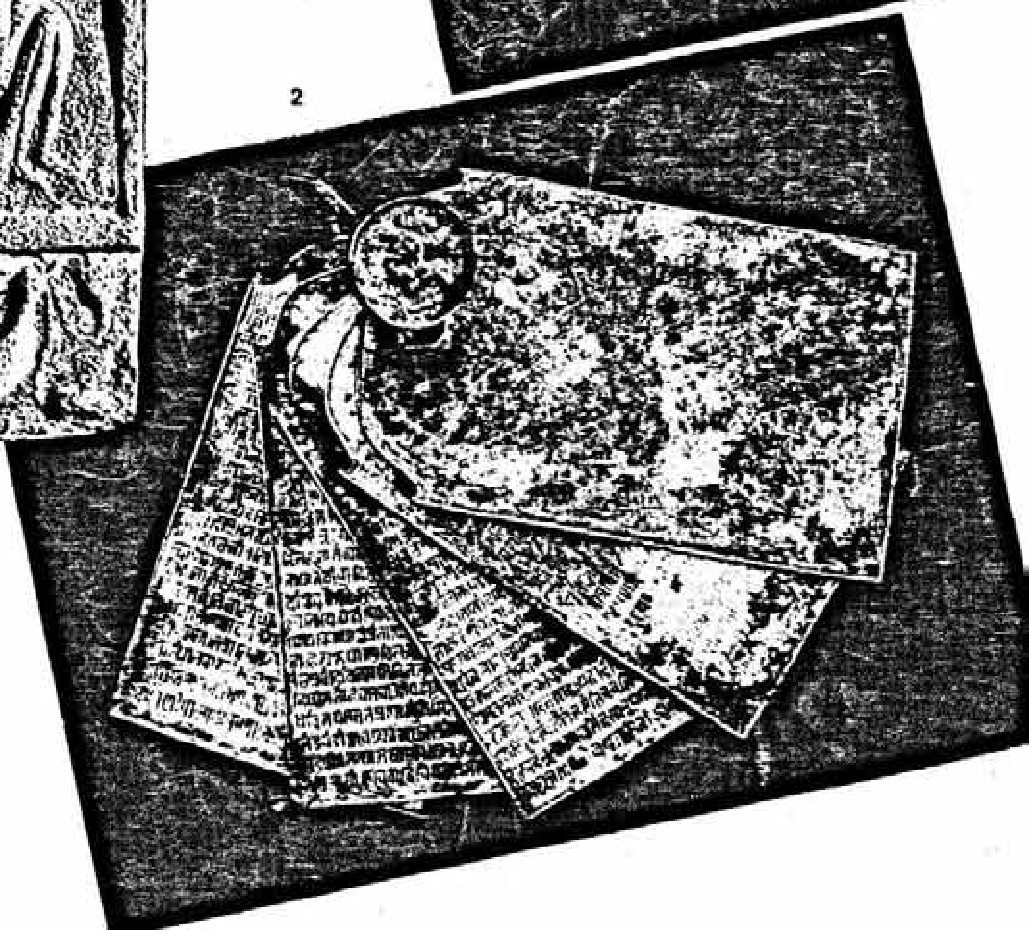


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INDIAN ARCHAEOLOGY 1976-77
—A REVIEW

EDITED BY

B. K. THAPAR

Director General

Archaeological Survey of India

ARCHAEOLOGICAL SURVEY OF INDIA

GOVERNMENT OF INDIA

NEW DELHI

1980

Cover: 1, decorated terracotta tile from Harwan (p. 94) ; 2, copper-plate from Anekannambadi (pp. 59-60) ; and 3, inscribed seal from Sanghol (pp. 78-79).

Price : Rs. 65-00

PRINTED AT NABA MUDRAN PRIVATE LTD., CALCUTTA, 700 004

PREFACE

This issue of the *Review* for 1976-77, like its twenty-three earlier ones, includes matter on the archaeological activities in the country during the previous year. The matter, as is well known, has come from diverse sources—State Departments of Archaeology, Universities, museums, research institutions and laboratories and the various offices of the Archaeological Survey of India—and I gratefully acknowledge the cooperation of all those whose contributions have been incorporated here.

In the course of sorting and editing this vast mass of material, which is ever expanding, some errors are likely to creep in, and if there are any, I must apologize for them. At the same time I feel that if the contributors could supply their respective reports in the format followed in the successive issues of the *Review,* we may perhaps be able to eliminate possible inaccuracies; this, incidentally would also help us in bringing out the publication on time.

I heartely thank my colleagues in the Archaeological Survey of India who have helped me in bringing out this volume, this being the fourth within a span of just one year.

New Delhi,
24 December 1979

B. K. THAPAR

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INDIAN ARCHAEOLOGY 1976-77

—A REVIEW

I. EXPLORATIONS AND EXCAVATIONS

ANDHRA PRADESH

1. EXPLORATION IN DISTRICT CUDDAPAH.—Shri I. K. Sarma assisted by Sarvashri D. Hanumantha Rao, T.S.R. Murthy and S. Konda Reddy of the South-eastern Circle of the Archaeological Survey of India[1] explored the submersible area (19,197 sq km) under Mailavaram project, and brought to light the following sites (fig. 1) on both the banks of the river Pennar.

(LPA=Lower Palaeolithic Age; MPA=Middle Palaeolithic Age; -MES=Mesolithic; EHS= Early historical site; BRW=Black-and-red Ware; RSW=Red-slipped ware; LMM=Late Medieval mosque; LMT=Late Medieval temple; HS=Hero-stone ; LS=Loose sculptures; CS=Cave shelter; and EP=Epigraphs)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Cuddapah	Jammalamadugu	Bhakrapet	LMM, LMT
-do	-do-	Chautapalle	LS, EP, LMT, LMM
-do-	-do-	Dappalle	LPA, MPA, MES
-do-	-do-	Diguvapalle	LPA, MPA, MES
-do-	-do-	Diguvapatnam	RSW, LS
-do-	-do-	Gandlur	LMT, LS, EP
-do-	-do-	Khadrabad	LMT, LS, EP
-do-	-do-	Mailavaram	LMT, LS, EP
-do-	-do-	Nekunampcta	LS, EP
-do-	-do-	Patapct	LMT, HS, LS, CS, EP

Besides, the rock-shelters on a low hill near Dappalle village contain prehistoric paintings in red ochre on the inner surface of the shelters. The paintings represent groups of stylized animals such as bull, goat, deer, boar, besides human and mystic symbols.

The Registering Officer of the Department of Archaeology and Museums, Government of Andhra Pradesh, stationed at Tirupati, during his exploration in the District, brought to light ancient sites at Dongalasani and Nandalur.

2. EXPLORATION IN DISTRICT GUNTUR.—Shri I. K. Sarma of the South-eastern Circle of the Survey discovered a unique brick (size: 44 X 22 X 8 cm) temple, dedicated to Asitanga

[1]The Archaeological Survey of India is referred to in the following pages as the 'Survey'.

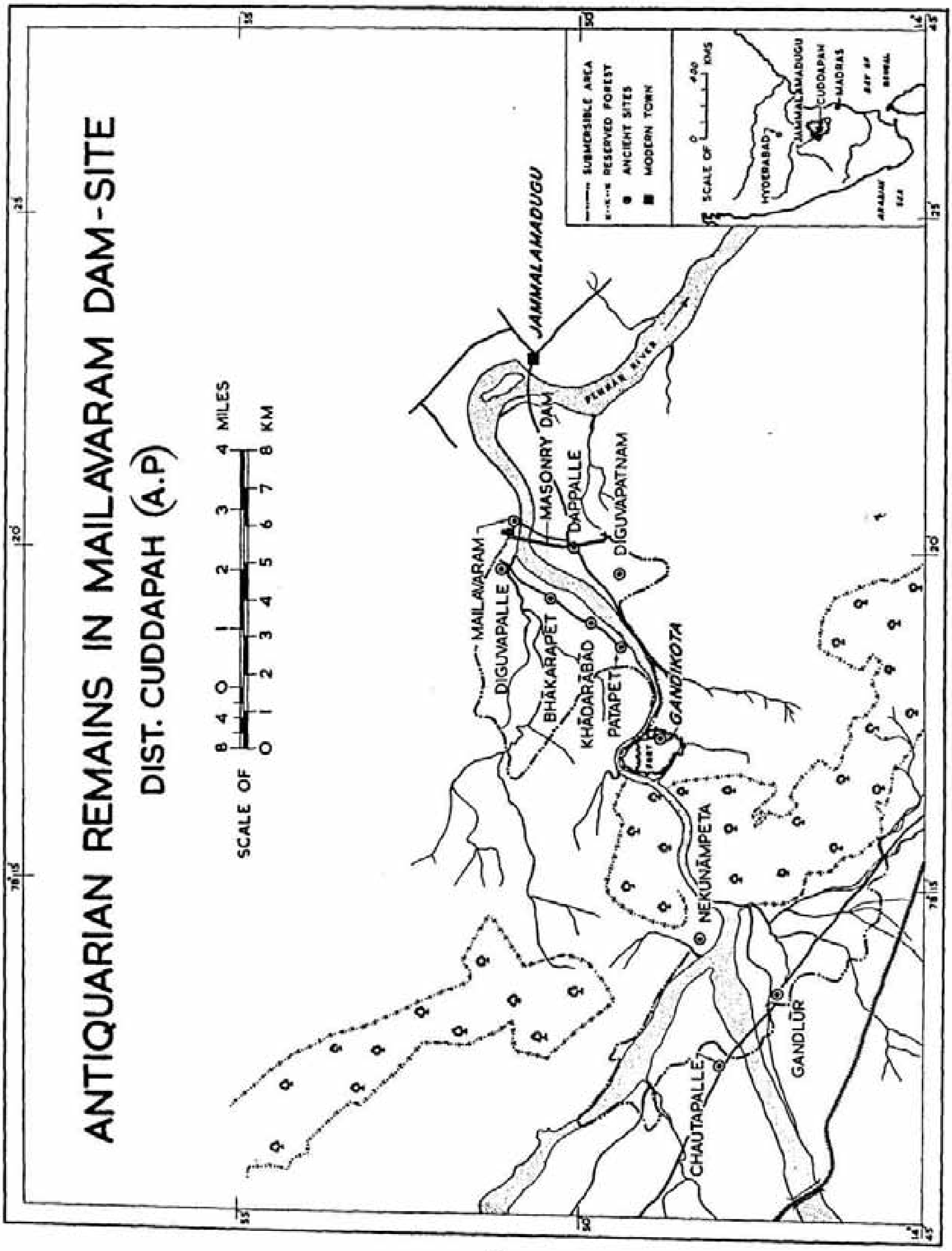

ANTIQUARIAN REMAINS IN MAILAVARAM DAM-SITE
DIST. CUDDAPAH (A.P)
SCALE OF 8 4 0 1 2 3 4 MILES
0 1 2 3 4 5 6 7 8 KM
JAMMALAMADUGU
PENNAR RIVER
MASONRY DAM
DAPPALLE
DIGUVAPATNAM
MAILAVARAM
DIGUVAPALLE
BHĀKARAPET
KHĀDARĀBĀD
PATAPET
GANDIKOTA
FORT
NEKUNĀMPETA
GANDLŪR
CHAUTAPALLE
SUBMERSIBLE AREA
RESERVED FOREST
ANCIENT SITES
MODERN TOWN
SCALE OF 0 420 KMS
HYDERABAD
JAMMALAMADUGU
CUDDAPAH
MADRAS
BAY OF BENGAL
ARABIAN SEA

FIG. 1

Bhairava, having a square *garbha-griha,* a narrow *antarala,* fronted by a square *mandapa* with flat roof, situated on the hill called Meghala Mallayya-konda at Chejerla village in Narasaraopet Taluk. The temple may be assigned to the Ananda-gotrin kings of fifth to sixth centuries A.D. The enshrined deity in the *garbha-griha* is a form of Bhikshatanamurti Siva, carved in bold relief on a dolerite slab, the depiction revealing a four-handed nude Siva in *tribhanga.*

A number of natural caverns, excavated into Khondalite rock, and having crude semi-circular entrances and partitioned by baked brick (size: 44 x 22 x 8 cm) walls, were also noticed. Lower Palaeolithic tools were collected from the slopes of the hill.

Shri I. K. Sarma, accompanied by Shri Shankarnath of the Circle, collected pebble tools and bifacial handaxes of the Lower Palaeolithic Age and neolithic axes from the fields at Muttayapalem in Guntur Taluk.

3. EXCAVATION AT DUPADU, DISTRICT GUNTUR.—The Department of Archaeology and Museums, Government of Andhra Pradesh, excavated a Buddhist site at Deebegutta or Ralla-gutta, and exposed a *stupa-structure* of baked bricks. The extant height of the walls of the dome is 1-80 m. The excavation also exposed *the pradakshina-patha* and *ayaka*-platforms on the northern and western sides. The vertical face of the drum and the *ayaka*-platforms were found plastered with lime-mortar. The *ayaka* -platforms which might have faced the entrances on the west and north were decorated with carved slabs, depicting themes such as devotees worshipping *Bodhi* tree, a *stupa* having *ayaka* -platforms, pillars, *torana,* railing and pavilion, a horse and a frieze of winged lions in galloping posture. One of the slabs bears an inscription in Brahmi characters of first-second century A.D. *The pradakshina-patha* measures 2*70 m wide and is bound by a 65-cm wide wall.

4. EXCAVATION AT KEESARAGUTTA, DISTRICT HYDERABAD.—In continuation of previous season's work *{Indian Archaeology 1975-76—A Review*[1], pp. 1-2), the Department of Archaeology and Museums, Government of Andhra Pradesh, resumed excavation with a view: (i) to connecting the earlier exposed structures 1 and 2; and (ii) to tracing the extension of the compound wall around structure 1. The excavation exposed the original ground level in between structure 1 and the compound wall. The flight of steps on either side of the entrance in the compound was also exposed. Inside the enclosure and towards the north-east of structure 1, another structure with multiple projections and recesses was encountered.

Pottery obtained from the excavation includes black, grey, red, red-slipped and black-slipped wares, the types represented being globular vases, spouted vessels, dish-on-stand, sprinklers, rimless bowls, etc. Among finds noteworthy were: the Vishnukundin coins with squatting lion having spiralled tail on the obverse and *purna-kumbha* flanked by lamp-stands on the reverse; terracotta spools having incised decorations such as radiating lines, a lotus-design inside a circle and punched stars around the periphery and in the centre; beads of terracotta and semi-precious stones; and polished *linga.*

5. EXCAVATION AT BUDIGEPALLY, DISTRICT KARIMNAGAR.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted trial digging at Budigepally, where a number of rock-shelters, megalithic burials, rock-paintings and fort belonging to the medieval period had been noticed. The excavation revealed three periods of occupation, viz., neolithic, megalithic and medieval. The neolithic period is represented by handmade burnished grey and dull red wares, microliths, such as blades, crescents and neolithic

[1]The above-mentioned publication is referred to in the following pages by the year only.

celts, whereas the megalithic period is represented by the Black-and-red Ware and associated wares. The medieval period is represented by glazed pottery and associated wares.

6. EXCAVATION AT DHULIKATTA, DISTRICT KARIMNAGAR.—In continuation of last year's work *(1975-76,* pp. 2-3), the Department of Archaeology and Museums, Government of Andhra Pradesh, resumed excavation at Dhulikatta.

The excavation exposed the southern gateway-complex, with a row of guard rooms (6.3 X 3·0 m) on either side of the pathway, and other structures. The structures were constructed by cutting across the earlier mud-fortification wall. The flooring of the guard rooms was paved with bricks (size: 56 X 27 X 7 cm), while the central pathway was laid with rubble topped over by *morum* and silt. On the southern side of the gateway, another structure of earlier phase, with western wing having *svastika* plan and a room (2·70 X 1.15 m), was exposed. Besides a cistern with brick-paved floor and flight of steps was also unearthed.

Excavation around the *stupa* revealed a structure showing rooms (3.50 X 3.60 m) with verandah (pl. I A), adjoining the *ayaka* -platforms on the north and west of the *stupa.* Another wall running parallel to the rear wall of the above structure was also exposed.

Excavation in the area where a palace-complex had been traced earlier, was continued to expose further extension of the enclosure wall and residential quarters. Structural activity in the area can be divided into six phases.

Phase I is represented by a huge enclosure wall (30.50 X 2.60 X 0.80 m), raised over a single course of rubble foundation, and two parallel walls running east-west, encountered at a depth of 1 .60 m below surface. These structures are contemporary to the first phase of the construction of the *stupa.* Pottery from the phase is represented by red, brown, tan and dull black-and-red wares. Types include: conical bowls, globular vases, storage jars, etc., in pale red ware; frying pans or dishes, lids and storage jars in brown ware; and rimless bowls and dishes in dull black-and-red ware. A few storage jars and vases were found decorated with incised triangles and finger-tip impressions.

Phase II is marked by two structures with two rooms each and another structure with one room, built over a foundation of rammed brownish earth over the debris of the earlier phase. Besides, a floor, laid in lime-concrete, was also encountered. Pottery of the earlier phase continued to be used in this phase.

Phase III is characterized by spacious halls with floors paved with bricks (pl. IB), massive structures granaries and wells provided with sewerage. A beautiful ivory button-seal with legend *Ajani Siriya Game Kumariya,* written in Brahmi characters, was found from the well. Satavahana potin coins and a few gold beads were recovered from the granaries. Ceramic industry of this phase includes: pale-red ware, represented by deep bowls, sharply carinated vessels, narrow-necked vases, dishes, *lotas,* lamps and finials, etc; red ware, comprising vases of medium and miniature pots and grain-measures; red-slipped ware; black-and-red ware, represented by bowls and dishes; and a few sherds of tan ware.

Phase IV is marked by reused brick structures having plastered walls burnished to smooth surface, a well connected to a square (1.25 m) soak-pit, built of bricks, and granaries.

Phase V was the continuation of the earlier phase. The plans of the exposed structures, however, could not be identified, as they are disturbed. The pottery of Phases IV and V belongs to the late Satavahana period.

Phase VI shows remarkable change in the habitation pattern. The structural activity in bricks came to an end, and small hutments, probably of artisans, who produced conch bangles and beads of precious and semi-precious stones, were built over the debris of the earlier phases. Noteworthy among the finds are: lead coins with horse on the obverse and probably a bow and arrow on the reverse, from the early levels; a potin coin with horse on the obverse and a hill with three arches on the reverse, from middle level; a Roman coin in base-silver with

head of Emperor Augustus on the obverse and Livia on the reverse; copper objects, such as seated lady with child, antimony rods, rings, knives, etc.; terracotta objects like a female figurine, probably mother goddess, wearing ornaments and holding prominent breasts in her hands; moulds of punch-marked coins; ivory button-shaped seal and comb; beads of terracotta, amethyst, crystal, jasper and faience; and iron objects, such as agricultural implements, ladle, lamp, nails, rivets and hinges.

7. EXPLORATION IN DISTRICTS KHAMMAM AND WARANGAL.—In the course of exploration in the Districts, the Department of Archaeology and Museums, Government of Andhra Pradesh, noticed temples and inscriptions of the Kakatiya period at Kusumanchi and Vedantapuram in District Khammam, and at Jakaram and Liabarthy in District Warangal. Besides, a few Jaina vestiges and a number of megalithic cairn-circles at Mettigutta, and a neolithic and early historical habitation site at Paidipally, both in District Warangal, were noticed.

8. EXCAVATION AT NELAKONDAPALLY, DISTRICT KHAMMAM.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted trial excavation at two sites situated near the village Nelakondapally, and brought to light a *stupa* at Viratraj Gadda or Erradibba, 2 km north-east of the village, and pottery, coins, etc., of the Ikshvaku period, from the occupation deposit at Bairagi Gutta, close to the village. Probably, both the sites belong to the Ikshvaku period, and the lead coins with elephant with raised trunk, the pottery, consisting of red ware, etc., and terracotta human figurine, recovered from the excava tion, are comparable to the ones of the same period from Nagarjunakonda and Yelleswaram.

9. EXCAVATION AT AGIRIPALLI, DISTRICT KRISHNA.—The Department of Archaeology and Museums, Government of Andhra Pradesh, conducted excavation at megalithic burial site at Agiripalli. During the excavation seven burials were exposed.

Megalith 1 is a cist-burial with cairn packing. The circle stones are either missing or were not provided, as the raw material is not available in the near vicinity. The cist is rectangular on plan having the eastern and western orthostats (T80 m) longer than the southern and northern ones (0*75 m). The chamber is not provided with any port-hole, but has a floor slab at a depth of T15 m. No capstone was found. The deposits inside the cist chamber included pottery of red and Black-and-red Wares, a few calcined bones and an iron object.

Megalith 2 is also a cist-burial (pl. II A), comparable to the above one, but with the northern orthostat standing taller than the others. The funerary deposits within the cist chamber comprised: four skulls near the western orthostat, two near the eastern orthostat (pl. II B), and some bones placed below the skulls, besides pottery of pale-red and Black-and-red Wares.

Megalith 3 is also similar to the above ones, and yielded pottery of the typical Black-and-red vases with flanged rim and carinated at the base and three lids in red ware.

Megaliths 4 and 5 are terracotta sarcophagi (pl. IIC), measuring 1.37 X 0.45 X 0.47 and 1.12 X 0.45 X 0.50 m, having six legs each. Of these one sarcophagus yielded two vases in Black-and-red Ware, and a straight-sided beaker type of bowl in red ware, and a few splinters of calcified bones.

Megaliths 6 and 7 are urn-burials, placed side by side. The urn with globular body, round base and slightly everted rim, is in red-slipped ware, decorated with concentric bands. The urns yielded a few calcined bones.

10. EXPLORATION IN DISTRICTS KURNOOL AND MAHBUBNAGAR.—Shri I. K. Sarma, assisted by Dr T.V.G. Sastry, Sarvashri B. Raja Rao and Y. Krishna Rao, of the South-eastern Circle

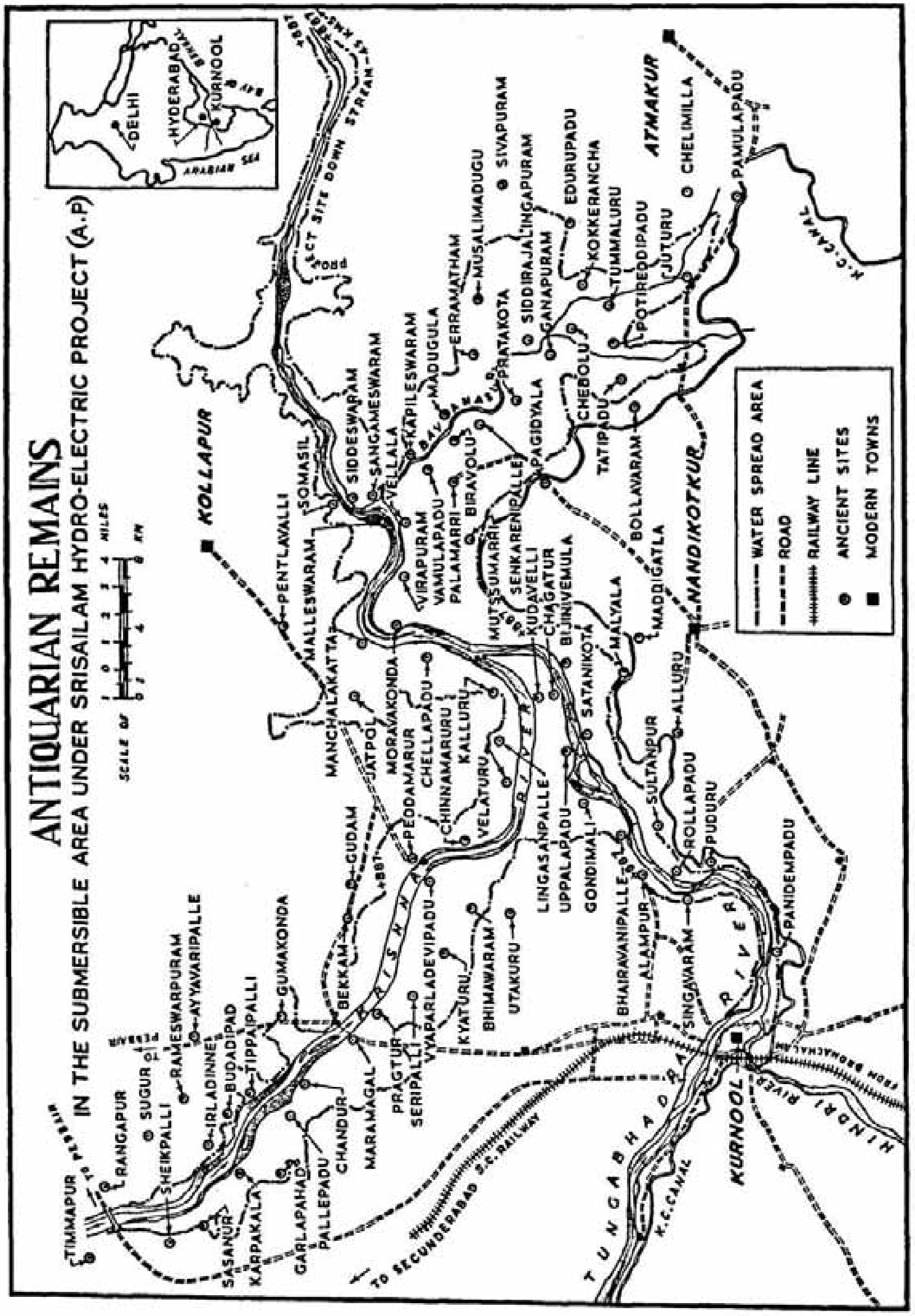

ANTIQUARIAN REMAINS
IN THE SUBMERSIBLE AREA UNDER SRISAILAM HYDRO-ELECTRIC PROJECT (A.P)
SCALE OF MILES
KM
DELHI
HYDERABAD
KURNOOL
ARABIAN SEA
KOLLAPUR
ATMAKUR
NANDIKOTKUR
KURNOOL
WATER SPREAD AREA
ROAD
RAILWAY LINE
ANCIENT SITES
MODERN TOWNS
TIMMAPUR
RANGAPUR
SUGUR
SHEIKPALLI
RAMESWARPURAM
AYYAVARIPALLE
IRLADINNE
BUDADIPAD
TIPPAPALLI
GUMAKONDA
SASANUR
KARPAKALA
GARLAPAHAD
PALLEPADU
CHANDUR
MARAMAGAL
PRAGTUR
SERIPALLI
VYAPARLADEVIPADU
KYATURU
BHIMAWARAM
UTAKURU
BEKKAM
GUDAM
PEDDAMARUR
CHINNAMARURU
VELATURU
JATPOL
MORAVAKONDA
CHELLAPADU
KALLURU
MANCHALAKATTA
MALLESWARAM
PENTLAVALLI
SOMASIL
SIDDESWARAM
SANGAMESWARAM
VELLALA
KAPILESWARAM
MADUGULA
ERRAMATHAM
MUSALIMADUGU
SIVAPURAM
SIDDIRAJALINGAPURAM
GANAPURAM
EDURUPADU
KOKKERANCHA
TUMMALURU
POTIREDDIPADU
JUTURU
CHELIMILLA
PAMULAPADU
PRATAKOTA
PAGIDYALA
CHEBOLU
TATIPADU
BOLLAVARAM
BIRAVOLU
VIRAPURAM
VAMULAPADU
PALAMARRI
MUTSSUMARRI
SENKARENIPALLE
KUDAVELLI
CHAGATUR
BIJINIVEMULA
SATANIKOTA
MALYALA
MADDIGATLA
ALLURU
SULTANPUR
ROLLAPADU
PUDURU
LINGASANPALLE
UPPALAPADU
GONDIMALI
BHAIRAVANIPALLE
ALAMPUR
SINGAVARAM
PANDEMPADU
KRISHNA RIVER
TUNGABHADRA RIVER
HINDRI RIVER
K.C. CANAL
TO SECUNDERABAD
SECUNDERABAD S.C. RAILWAY

FIG. 2

of the Survey, conducted exploration in the submersible area under Srisailam Project in the above Districts, and brought to light the following sites (fig. 2).

(LPA= Lower Palaeolithic Age; MPA = Middle Palaeolithic Age; MES = Mesolithic; MB = Microlithic blades; NC=Neolithic culture; MC' = Megalithic culture RW—Rouletted Ware; EH= Early historical; LH—Late historical; CT=Chalukyan temples; KT=Kakatiya and pre-Vijavanagara temples; VT=Vijayanagara temples; LS=Loose sculptures; and EP=Epigraphs)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Kurnool	Kurnool	Panidempadu	MPA, VT, LS
-do--d	-do-	Puduru	MPA, CT, VT
o--do-	-do-	Rollapadu	CT, LS
-do--d	-do-	Sultanpur	CT, VT, LS
o--do-	Nandikotkur	Alluru	EPA, MPA, MC, CT
-do--d	-do-	Bannuru	EH
o--do-	-do-	Bijinivemula	CT, LS
-do--d	-do-	Biravolu	CT
o--do-	-do-	Bollavaram	EH
-do--d	-do-	Chebolu (hamlet)	KT, VT, LS, EP
o--do-	-do-	Chilmilla	CT, LS
-do--d	-do-	Edurupadu	EH, CT, EP
o--do-	-do-	Ganapuram	VT,LS
-do--d	-do-	Juturu	KT, LS, EP
o--do-	-do-	Kapileswaram	CT, KT
-do--d	-do-	Kokkerancha	LS, EP
o--do-	-do-	Maddigatla	EH
-do--d	-do-	Madugula (hamlet)	CT
o--do-	-do-	Moravakonda	CT, LS
	-do-	Musalimadugu	CT, VT, LS, EP
-do-	-do-	Mutssumarri	CT, LS
	-do-	Pagidyala	CT, LS
-do-	-do-	Palamarri	CT, LS
	-do-	Pamulapadu	EH, EP
-do-	-do-	Potireddipadu	EH
	-do-	Pratakota	CT to VT, LS, EP
-do-	-do-	Sangameswaram (Bhavanasi)	CT, LS, EP
-do-	-do-	Satanikota	LPA, MPA, MC, EH, RW, CT, LS, EP
	-do-	Siddeswaram	EH, CT, LS
	-do-	Siddhirajalingapuram	MPA, MES, EH, RW, KT, VT
	-do-	Sivapuram	CT,LS
	-do-	Tatipadu	KT, VT, LS
	-do-	Tummaluru	LS
	-do-	Vamulapadu	MES, EH, RW
	-do-	Vellala	EH, CT, LS

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Mahbubnagar	Alampur	Alampur	CT, LS, EP
-do-	-do-	Bhairavanipalle	CT, LS, EP
-do-	-do-	Bhimawaram	KT, LS
-do-	-do-	Chagatur	EH, RW
-do-	-do-	Chandur	CT, LS
-do-	-do-	Garlapahad	EH
-do-	-do-	Gondimali	GT,LS
-do-	-do-	Karpakala	NC, EH, RVV
-do-	-do-	Kudavelli	MPA, MES, NC, MC, EH, RW, CT, LS, EP
-do-	-do-	Kyaturu	LPA, MPA, MES, EH
-do-	-do-	Maramagal	CT, LS, EP
-do-	-do-	Pallepadu	CT, EP
-do-	-do-	Pragtur	MES, EH, CT, LS, EP
-do-	-do-	Sasanur	MPA, KT
-do-	-do-	Seripalli	MES, EH
-do-	-do-	Sheikpalli	NC, MB
-do-	-do-	Singavaram	MPA, MES
-do-	-do-	Timmapuram	EH
-do-	-do-	Uppalapadu	MPA, MC
-do-	-do-	Utakuru	EH, CT, LS
-do-	-do-	Vyaparladevipadu	EH, RW
-do-	Kollapur	Bekkam	CT, LS, EP
-do-	-do-	Chellapadu	MC, EH, CT, VT, LS
-do-	-do-	Chinnamaruru	EH, KT, VT, LS
-do-	-do-	Gudam	CT, LS, EP
-do-	-do-	Jatpol	CT to VT, LS
-do-	-do-	Kalluru	VT, LS
-do-	-do-	Lingasanpalle	EH
-do-	-do-	Malleswaram	NC, CT, VT, LS, EP
-do-	-do-	Manchalakatta	MES, CT to VT, LS, EP
-do-	-do-	Peddamarur	VT, LS
-do-	-do-	Pentlavalli	MES (Stray)
-do-	-do-	Somasil	MPA, CT, KT, LS, EP
-do-	-do-	Velaturu	MES, NC, VT, LS
-do-	-do-	Yellur	EH
-do-	Wanaparti	Ayyavaripalle	VT, EP
-do-	-do-	Budadipad	LPA
-do-	-do-	Gumakonda	NC, EH, VT, LS, EP
-do-	-do-	Irladinne	VT, EP
-do-	-do-	Miyanpur	EP
-do-	-do-	Rameswarpuram	NC, LH
-do-	-do-	Rangapur	MES, NC, LH
-do-	-do-	Sugur	VT, LS
-do-	-do-	Tippaipalli	EH, RW, VT, LS, EP
-do-	-do-	Yaparla	LS

11. EXPLORATION IN DISTRICTS NELLORE AND PRAKASAM.—The Registering Officer of the Department of Archaeology and Museums, Government of Andhra Pradesh, stationed at Nellore, brought to light the following sites.

(LPA = Lower Palaeolithic Age; MPA—Middle Palaeolithic Age; MH=Megalithic habitation; and MB = Megalithic burials)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Nellore	Atmakur	Anantasagaram	MPA
-do--	-do-	Mohammadapuram	MPA
-do-	-do-	Sangam	LPA, MPA
-do-	Nellore	Kottur	MPA
-do-	-do-	Narasimhakonda	MPA
-do-	-do-	Padamatipalem	MPA
-do-	-do-	Venkatachala Satram	LPA, MPA
-do-	Rapur	Akilavalasa	MPA
-do-	-do-	Dachur	MPA, MH
-do-	Udayagiri	Marripadu	LPA, MPA
-do-	-do-	Udayagiri	LPA, MPA
-do-	Venkatagiri	Bangarupalem	MPA
Prakasam	Addanki	Kondidena	MPA
-do-	-do-	Ramkur	MB
-do-	Kandukur	Tangutur	MH

12. EXCAVATION AT JONNAWADA, DISTRICT NELLORE.—The Director of Archaeology and Museums, Government of Andhra Pradesh, conducted excavation at a megalithic burial site at Jonnawada, on the left bank of the river Pennar in Kovur Taluk.

The three excavated megalithic burials are comparable to the rock-cut cave-burials of Kerala. The chambers circular in plan and hemispherical in elevation, are cut into the laterite to a depth of 1.50 m, having a circular opening, 85 to 45 cm in diameter on the top, and T80 m diameter at the base. The opening was closed by a capstone. The burial was perhaps bound by cairn-circle on the surface. These underground burial chambers yielded: terracotta sarcophagi; bowls of Black-and-red Ware; funnel-shapped lids in Black-and-red and black wares; big vases in red ware; and beads of semi-precious stones.

13. EXCAVATION AT CHANDAVARAM, DISTRICT PRAKASAM.—In continuation of last year's work *(1975-76,* pp. 3-4), the Department of Archaeology and Museums, Government of Andhra Pradesh, carried out excavation at Chandavaram.

Excavation revealed three monastery complexes on the man-made terraces with retaining walls and flight of steps.

Monastery-complex 1, situated on the first terrace, is quadrangular on plan, and has an open courtyard surrounded on three sides by nineteen cells with verandah and entrance on the south. The entrance is flanked by two apsidal structures which were plastered with lime. The flooring of the cells was paved with stone slabs laid over a soling of mud mixed with stone chips.

Monastery-complex 2, situated on the second terrace, could not be traced as it has been completely disturbed. However, some traces of walls could be seen, and one room at the eastern end of the terrace was exposed.

Monastery-complex 3, situated on the third terrace, had four cells and verandah against the back-drop of a high shale stone wall. Another structure exposed by the excavation showed a portion of a pavilion with twelve pillar bases, probably serving as a courtyard to the cells running around it. Remains of a *chaitya* on the western end of the terrace was also exposed.

The ceramic industry is represented by black-and-red, red, black wares in coarse fabric, red-slipped, black-slipped and grey wares, besides the distinctive Rouletted Ware. One coin bearing a legend *Rano Siri Satakarnisa* on obverse depicting a bull was found from a drain of the monastery.

14. EXPLORATION IN DISTRICT SRIKAKULAM.—Shri I. K. Sarma of the South-eastern Circle of the Survey noticed extensive, but disturbed, ancient mounds at Kalingapatnam and Nagarlapet, in proximity to the sea, yielding early historical finds including red-slipped and Rouletted Wares and baked bricks (size: 44x22 x 8 cm). A broken image of Surya of ninth-tenth century was found at Nagarlapet. A huge *stupa* mound was noticed at Kalingapatnam.

15. EXCAVATION AT POLAKONDA, DISTRICT WARANGAL.—In continuation of the previous year's work *{1975-76,* pp. 5-6), the Department of Archaeology and Museums, Government of Andhra Pradesh, resumed excavation at Polakonda.

Excavation revealed a sequence of three cultures, viz., neolithic, early historical, probably coeval with the megalithic, and the Kakatiya. In one of the trenches, a flooring of the neolithic occupation showed two unfinished axes, a polished granite ball with battering marks on one end and a boulder with flat top surface. Hammer-stone and an adze were also encountered from the neolithic levels. Microlithic industry of the period is represented by blades and fluted cores made on chert, chalcedony, rock-crystal and carnelian. A few bone tools were also encountered. The ceramics were represented by the ubiquitous burnished grey, pale-grey, blotchy brown (tan), black burnished and pale-red wares, noteworthy types being rimless bowl, trough, vase with elongated rim and flared rim (pl. IID), dish-on-stand and lug handles.

A discontinuity in the occupation between the neolithic and the succeeding culture was observed in two trenches, but in other trenches this phenomenon was absent. The megalithic or early historical level yielded red, tan, pale-red and Black-and-red Wares. Handmade burnished brown and black wares are also represented by a few sherds. Iron objects from this level include arrow-heads, knife and blade.

The Kakatiya period is represented in the top layers which were found badly disturbed.

16. EXPLORATION IN DISTRICT GODAVARI.—Shri I. K. Sarma of the South-eastern Circle of the Survey located an ancient site near Kantamanenivarigudem on the bank of an ancient nullah towards south-west of Guntupalli. The site was found studded with baked brick structures. The exposed sections of the site revealed a cultural sequence extending from the early historical to the late medieval times. Among the finds, mention may be made of a sculp ture of Jaina *tirthankara* and sherds of black-and-red and red-slipped wares.

BIHAR

17. EXCAVATION AT ANTICHAK, DISTRICT BHAGALPUR.—In continuation of the previous season's work *(1975-76,* pp. 6-7), the Vikramashila Excavation Project of the Survey, under Dr B. S. Verma, assisted by Sarvashri S. C. Saran, A. Mukherji, T. K. Shrivastva and B. Singh, resumed excavation with the main objective of exposing the remaining structures of the *Mahavihara.*

Altogether sixty-seven trenches, each measuring 10 X 10 m in area, were taken for excavation: forty-one on the eastern wing, fourteen on the southern, three in the courtyard between central shrine and the southern wing and nine on the northern mound outside the monastery complex.

Excavation in the eastern wing revealed forty cells with common verandah (pl. III), three rectangular and three circular projected cells, besides traces of three more underground chambers. Similarly, in the trenches on the southern wing, thirteen cells with common verandah (pl. IV), besides two rectangular and one circular projected cells, have been exposed. The excavation in the trenches in the courtyard established sequential relationship between the southern wing and the central shrine. The inner retaining wall of the verandah is practically robbed, the traces of it in some places could be seen in the form of one or two courses of bricks. The floor of the cells and the verandah were found also badly damaged. The cells, including rectangular and circular, were originally provided with bed-platforms. The sizes of the bed-platforms vary from cell to cell, the average being 3 X 2 m.

Excavation outside the monastery-complex yielded structures of different phases of construction, though without complete plan. One of the structures showed two walls, running north-south and east-west, standing to a height of thirty courses of bricks and having a width of 1.64 m and 1.4 m respectively. The latter wall was provided with small shrines, one of which contained a sculpture of Kamadeva (pl. V A) in black stone, ascribable to the late phase of structural activity. Besides, three damaged brick *stupas* and traces of brick-paved floors with post-holes, of late phase, were also exposed. Other noteworthy finds from the area are : an image of Shadakshari Avalokitesvara (pl. V B), two mutilated Lokesvara (pl. V C) and a head of Lokesvara (pl. V D), all in black stone, two *Siva-lingas* in bluish stone, carved stone pieces, votive *stupas* and pedestals.

In one of the trenches outside the monastery, four human skeletons, 1.5 m apart, oriented north to south with head turned towards west and left hand resting on the chest, were encountered at a depth of 1.0 m below surface. The length of the skeletons varied from 1.0 to 1.73 m. These burials, however, could not be dated in the absence of any associated find.

The antiquities recovered from the excavation include: terracotta plaques, representing lotus medallion, Buddhist themes, floral design; terracotta figurines (pl. VI A) like birds, animal and human, moulds, sealings, etc.; stone images (pl. VI B), such as Buddha, Ganesa on a door lintel, a deity in seated posture, an intricately carved *torana* with Buddha, and a dragon face in limestone (pl. VI C); and a beautiful bronze image of Manjusri (pl. VI D). Besides, objects of copper, iron and ivory were also recovered.

18. EXCAVATION AT CHAMPA, DISTRICT BHAGALPUR.—In continuation of the last year's work *(1975-76,* p. 7), the Department of Ancient Indian History and Archaeology, Patna University, resumed excavation at Champanagar. The work was directed jointly by Sarvashri B. Narain and A. K. Singh, under the overall supervision of Professor B. P. Sinha, assisted by Sarvashri S. K. Kaviraj and J. P. Singh.

Excavation was taken up in three areas: CMP-1M, CMP-2A and CMP-2B, with a view to exposing the pre-Northern Black Polished Ware levels.

The digging in CMP-1M brought to light 1'26-m thick deposit of compact greenish and red clay, overlying the natural soil, yielding fragments of coarse black-and-red and red wares.

Excavation in CMP-2A confirmed that the drain, discovered earlier, belongs to the medieval period, not to the Northern Black Polished Ware phase as reported earlier.

The digging in CMP-2B exposed a w£/«-plastered platform, at a depth of 1.65 m below the surface. This platform, measuring 2'36 m sq and 0'34 m in height, rested over layer 4 which yielded Northern Black Polished Ware, and was sealed by layer 2A yielding the medieval glazed pottery. Another interesting structure encountered at a depth of 43 cm was a drain of baked

bricks, running north-south, and resting over layer 5 which yielded coarse black-and-red, grey and red wares.

19. EXPLORATION IN DISTRICT GAYA.—During the course of exploration, Dr Sarjug Prasad Singh of the Department of Archaeology and Museums, Government of Bihar, noticed ancient sites at Bhelavar, Dharaut, Kachanama, Keur and Uttara. The sites at Bhelavar, Dharaut, Kachanama, Keur and Uttara yielded black-and-red and Northern Black Polished Wares, silver and copper punch-marked coins and copper cast coins, whereas the site at Keur yielded neolithic celts, microliths, represented by geometric and non-geometric tools, made on chert, carnelian and quartz, and black-and-red ware. Two sculptures, one of dancing Ganesa and the other of *Simhavahini* Durga, were obtained from Kachanama.

20. EXCAVATION AT KATRAGARH, DISTRICT MUZAFFARPUR.—In continuation of the previous year's work *(1975-76,* p. 8), the Department of Archaeology and Museums, Govern ment of Bihar, under Dr Sita Ram Roy, assisted by Dr Prakash Charan Prasad, Sarvashri Ajoy Kumar Sinha, Durga Nand Mishra 'Sudha', Krishna Kant Sharma, Narayan Chandra Ghosh, Jamil Akhtar, Lakshman Prasad Singh, Rajendra Prasad Singh, Raghunath Prasad Verma, Uma Shankar Pandit, Manjar Hasan, Ram Shekhar Singh and Shrimati Indumati Pathak, resumed excavation at Katragarh.

Excavation revealed three phases of construction of the fortification-wall. Phase I is represented by a baked brick wall (size: 40 X 24 X 7 cm) with recesses at the bottom. A brick-paved drain running through the fortification was also exposed. The fortification of Phase II is made of earth, with a moat around it, while that of Phase III is built of baked bricks (size: 50 X 30 X 8 cm). The wall was also provided with salients at intervals which were made of baked bricks. All the three phases of the fortification may be dated to the Sunga period on the basis of the associated antiquities.

The excavation within the fortifications revealed four periods of occupation. Period I is represented by a 1-40-m thick deposit, yielding: Northern Black Polished Ware and other associated wares; terracotta figurines (pl. VII A-B) of Mauryan period; beads of semi-precious stones; bone pins and styli; and copper antimony rods. Some of the grey ware sherds show linear painting in black, which can be compared to those found at Vaishali and Kausambi. The natural soil, however, could not be reached due to sub-soil water level.

Period II is marked by 2-90-m thick deposit yielding: Sunga terracotta figurines and plaques; beads of semi-precious stones; and terracotta seals and sealings. The terracotta plaques, depicting male and female figures (pl. VII A), deserve special mention, as they show high degree of craftsmanship, heavy ornamentation and varied styles of coiffure. The ceramic industry is represented by red, grey and black wares, which are made on fast wheel, except a few which might be handmade. Noteworthy types include vase, dish, bowl, *handi,* lipped bowl, lid-cum-bowl, storage jar, vase with decorated spout, etc. A few examples show floral decorations consisting of impressed dotted circlets. Besides, the Period was marked by intensive building activities in baked brick.

Period III is represented by a 1-0-m thick deposit yielding: gold coin of Huvishka; a few sealings, bearing the script of the first or early second century A.D.; and terracotta figurines with tenon heads. The ceramic industry of the period is represented by a red ware, coarse in fabric, devoid of any slip, but having wash. The types include vase, jar, *handi,* lugged handle, etc. Sprinklers in red ware, few sherds of micaceous red ware and a few vases showing incised and stamped designs are noteworthy. The exposed structures have single brick walls and probably had tiled roofs, as evidenced by broken tiles found in the debris.

Period IV is marked by a 98-cm thick deposit yielding a terracotta object with a fragmentary inscription assignable to the Pala period on palaeographical grounds, *Siva.-linga* and ceramic industry with red ware of coarse fabric. The structures encountered are of reused bricks, which would suggest the impoverished state of culture.

21. EXCAVATION AT KOLHUA, DISTRICT MUZAFFARPUR.—Shri Vijayakant Mishra, assisted by Sarvashri K. P. Gupta and D. P. Singh of the Mid-eastern Circle of the Survey, undertook excavation with a view to establishing relationship between the Lion Pillar and the *stupa* (pi. VIII).

The excavation revealed three structural phases of the *stupa* (pl. IX A). The earliest one was plastered with lime. In the second phase the *pradakshina-patha* was shortened and its floor was subsequently raised. In the final phase, the *stupa* was enlarged by providing another brick encasing. The last enlargement of the *stupa* was made over a rammed floor made of lime-*surkhi.* Besides, miniature *stupas* (pl. IX B) of different plan and dimensions were found to have been constructed around the main *stupa.* A *pradakshina-patha* was also provided between the miniature *stupas* and the main one. Some of the miniature *stupas* were also plastered.

The debris accumulated inside the treasure-hunter's pit at the centre of the *stupa* was cleared, to expose the double-walled square relic-chamber which was found heavily damaged. The pit was cut through the basement of the *stupa* into the natural soil. It was observed that the core of the *stupa* was built of bricks laid in criss-cross pattern, while the encasing masonry showed courses laid in headers and strechers.

Excavation at the Lion Pillar revealed the bottom stone on which the Pillar stands at a depth of 5.50 m from the present ground level. The entire free standing shaft measuring 12.65 m in height, was highly polished except the lower portion of 1.68 m from the base. The bottom stone was placed over the natural soil.

Excavation in the other trenches revealed that the top two layers are extensively disturbed by pits, probably due to brick robbing. The next preceding layer was mainly composed of small brick-bats and blackish earth, immediately over the latest floor level.

Important finds obtained from the treasure-hunter's pit comprise: objects of semi-precious stones, a few of which were embedded in bricks; gold leaves of different sizes and shapes; broken pieces of stone vase with typical Mauryan polish; a terracotta plaque depicting the standing Buddha with illegible inscription; and a terracotta head of a monkey.

22. EXCAVATION AT NALANDA, DISTRICT NALANDA.—In continuation of the previous year's work *(1975-76,* pp. 8-9), Shri Vijayakant Mishra, assisted by Shri D. P. Sinha of the Mid-eastern Circle of the Survey, resumed excavation. Debris in the shrine above the stone pedestal and in front was cleared. A semi-circular brick pedestal along with husks and lime-*surkhi* impression was exposed above the stone pedestal during the course of excavation. The facade of the southern part of the stone pedestal was found to bear paintings depicting human figures and floral designs.

23. EXPLORATION IN DISTRICT SINGHBHUM.—In continuation of the previous year's work *(1975-76,* p. 9), the Department of Archaeology and Museums, Government of Bihar, under Dr Sita Ram Roy, assisted by Sarvashri Naseem Akhtar, Ram Janam Prasad, Durga Nand Mishra 'Sudha', Krishna Kant Sharma, Narayan Chandra Ghosh and Raghunath Prasad Verma, explored the Suvarnarekha valley near Chandil in the District. Besides, the river Bamini a tributary of the Suvarnarekha was thoroughly explored from its confluence near Jayada upstream to Sasantand. Of the various implimentiferous cliff-sections, the three sections studied at Bhalukocha, Gangudih and Sasantand revealed two cycles of gravel deposits. The sequence of the deposit from base upwards was: large-sized cemented pebble-gravel intermixed with

lateritic matrix; red browny soil; middle-sized pebble gravel; red soil; and a small-sized pebble-gravel overlain by humus. The first deposit yielded Lower Palaeolithic tools, represented by handaxes and cleavers on quartzite, of which the former are predominant. A few tools of the Middle Palaeolithic Age, such as scrapers and points were recovered from the second deposit. It is noteworthy that a large number of handaxes, cleavers, scrapers and points of the Lower and Middle Palaeolithic Age were picked up from the river-bed itself. Besides, a number of neolithic celts were collected from Ghoranagi.

24. EXPLORATION IN DISTRICT VAISHALI.—In the course of exploration, Shri D. P. Sinha of the Mid-eastern Circle of the Survey, brought to light a number of sites yielding antiquities ranging from prehistoric period to the historic at Baggauti, Chainpur, Chauridih, Chechar, Dulargarh and Mansaidih, of which, the site at Chechar yielded neolithic celts, black-and-red ware sherds comparable to the ones from Chirand, beads and bone arrow-heads, typical of the period. Terracotta objects of Mauryan and post-Mauryan periods were also collected from the site.

DELHI

25. EXCAVATION AT SIRI FORT, DELHI.—Shri Raghbir Singh assisted by Sarvashri R. P. Sharma, B. P. Saxena and B. S. Negi, of the Delhi Circle of the Survey, conducted excavation at Siri Fort, built by Ala-ud-Din Khalji in *circa* A.D. 1303, with a view to: (i) exposing the north western bastion of the fortification-wall; (ii) tracing the fortification-wall; (iii) ascertaining the contemporary habitational deposits or palace-complex; and (iv) establishing the relationship of the habitational area with the fort-wall.

Excavation revealed that the fortification-wall was built of undressed rubble stones laid in lime mortar and was oval on plan with bastions at regular intervals. The fortification-wall shows a foundation of 2.50 m of rubble stones set in mud mortar and a lime plastered surface above the ground level.

The occupational deposit belongs to a single culture, represented by the ceramic industry of the early medieval period, which include red ware and Muslim Glazed Ware. Other note-worthy finds include coins, stone querns, balls and beads.

GUJARAT

26. EXPLORATION IN DISTRICTS AHMADABAD, AMRELI, BHARUCH, JAMNAGAR, JUNAGADH, KUTCH AND RAJKOT.—The Department of Archaeology, Government of Gujarat, in the course of exploration brought to light the following sites.

(LPA= Lower Palaeolithic Age; MES = Mesolithic; HC = Harappa Culture; EH'- Early historical; and M = Medieval)

District	*Taluk*	*Village/Site*	*Cultural assemblage*
Ahmadabad	Dholka	Bholad/Bhetadia Bhan-no-Timbo	EH
-do-	-do-	Chandisar/Brahmani Mata-no-Tekro	M
-do-	-do-	Chhabasar/Varudimata-no-Timbo	HC

District	*Taluk*	*Village/Site*	*Cultural Assemblage*
Ahmadabad	Dholka	Dev Dholera	M
-do-	-do-	Dholka/Fansigar-no-Tekro	M
-do-	-do-	Ganesh Dholka	M
-do-	-do-	Gundana Para	M
-do-	-do-	Juval Rupavati	M
-do-	-do-	Kanka/Bemol-no-Timbo	EH
-do-	-do-	Metal/Mahakali-no-Timbo	HG
-do-	-do-	Rupgadh/Ramalpur-no-Tekro	M
-do-	-do-	Shiyal/Magavana-no-Timbo	MES
-do-	-do-	Utelia/Dargehvalo Tekro	EH
Amreli	Jafarabad	Shiyabet	M
Bharuch	Hansot	Ilav/Gabhan-no-Timbo	M
-do-	-do-	Rajdevi	M
-do-	Vaghra	Vaghra/Gandhr-no-Timbo	M
-do-	Zagadia	Mota Andhra	MES
Jamnagar	Kalyanpur	Ran	M
-do-	Okhmandal	Dwarka/Dhenuka-no-Timbo	M
Junagadh	Junagadh	Dolatpur	EH
-do-	Talala	Kamleshwar	EH
-do-	-do-	Kankai	EH
Kutch	Anjar	Khedoi	HC
-do-	Bhuj	Kera	MES
-do-	Mundra	Beraja	MES
-do-	Nakhatrana	Guntaligadh	LPA
Rajkot	Upaleta	Dhank	M
-do-	-do-	Rishalka	M

27. EXPLORATION IN DISTRICTS BHAVNAGAR, JAMNAGAR, JUNAGADH AND RAJKOT.- In continuation of the last year's work (1975-76, pp. 10-12) in the coastal parts of Saurashtra, Professor R.V. Joshi, Drs. S.N. Rajuguru, R.S. Pappu and Shri S. Chakraborti of the Deccan College Post-graduate and Research Institute, Pune, assisted by research scholars Sarvashri Ravi Kori Settar, Arun Kumar and Technical Assistant Shri R B. Warke carried out geoarchaeological and geomorphological studies at a Lower Palaeolithic site at Samadhiala in District Bhavnagar and a reconnaissance survey of coastal formations and associated valley landforms between Veraval and Dwarka (pl. X A).

Lower Palaeolithic site at Samadhiala, situated 98 km north-west of Dhola junction, lies about 1 km inland from the southern bank of the river Kalubhar. Three trial pits were dug in the tool bearing formation to ascertain the stratigraphical position of the industry and to know about the nature of the culture. The main trial pit of 3 X 3 m, revealed the following succession of deposits, from top to bottom.

0 to 15 cm below surface	:	Surface soil with sandy gravel grades to
16 to 60 cm ,,	:	decalcified pebble gravel, moderately sorted, unstratified.
61 to 120 cm ,,	:	Bouldery, pebbly rubble gravel, poorly sorted, very well cemented and contains large (10-15 cm across) blocks of locally derived basalts. This is the main horizon of stone tools.

Below 1.20 m, digging in the rubble gravel was discontinued as the proportion of tools decreased. The rubble gravel was examined in nullah cutting near the site. The total thickness was found to be 2.5 m and only a few Lower Palaeolithic tools were recovered from the exposed part of the lower rubble. The rubble was found to be interlensed by calcrete lenses. It rests on a valley pediment surface cut over basaltic rock. Alluvial fill terrace, exposed on the left bank of the Kalubhar, rests against the rubble terrace occurring at an elevation of 10 m above the bed level of the Kalubhar. Rubble gravel and the Lower Palaeolithic tools found in it are, therefore, relatively older than the alluvial fill dated to the late Pleistocene.

Tool kit consists of shaped tools like handaxes, cleavers, scrapers, picks and choppers, and simple artefacts like flakes. The industry comprising little more than forty per cent bifaces, twelve per cent choppers and thirty-five per cent scrapers is Acheulian. Raw material employed for manufacture of tools is predominantly greenish fine-grained rhyolite. Most of the tools are extremely fresh in their physical condition, thereby suggesting that they were manufactured in the vicinity of the site. The excavated collection consists of a few handaxes and cleavers and a large number of light duty tools and waste products, thereby indicating that this was an occupation site where at least light duty tools (as suggested by the size of cores) were fashioned on the spot. The site is, therefore, in a semi-primary context.

An Acheulian handaxe on basalt was recovered from a fanglomerate, about 5 m thick, exposed on the right bank of the Sonarki nullah, draining the western slopes of the Girnar hills near Uparkot at Junagadh. The fanglomerate rests on Deccan Traps and is confirmably overlian by valley fill miliolite grading into wind-borne aeolianite.

Acheulian side flake on rhyolite was discovered in an old channel gravel, occurring on the right bank of the river Bhadar near Kutiyana, 40 km east of Porbandar. The gravel, moderately consolidated and 1 "0 m thick, rests on basalt at an elevation of 7 m above the present bed level.

In addition to these archaeological observations, the reconnaissance survey of the coastal formations was made at Mahuva (District Bhavnagar), Dwarka (District Jamnagar), Navi-Bandar, Porbandar, Veraval (District Junagadh) and Upleta (District Rajkot). The main purpose of these studies was to understand coastal formations in relation to fluvial deposits which yielded Lower Palaeolithic and Middle Palaeolithic tools in the last two field season's work.

On the beach at Mahuva, a 50-cm thick fossil dark brown tidal clay was found to occur on miliolite limestone at an elevation of 1.0 m above the high tide level. This clay band is overlain by semi-stabilzed dune sand. This evidence suggests rise in sea level during the Holocene. Occurrence of fossil coral bed more or less at the present sea level below the sub-recent tidal flat at Kuchadi, 10 km north of Porbandar, and of the intertidal shelly limestone at an elevation of 6 to 7 m above the mean sea level near Dwarka Railway Station, indicate that the sea level was higher by a few metres in the late Quaternary. Samples of corals, beach-rocks and oysters have been collected for radiometric dating. These dates will help in understanding the history of late Harappan and sub-Indus cultures at Prabhas Patan where the large scale excavation was carried out, and in which a large structural complex belonging to the late Prabhas Period (*circa* fifteen hundred-twelve hundred B.C.) and tentatively identified as a warehouse has been unearthed.

Occurrence of a bouldery beach-rock at an elevation of 2 m above high tide level and that of a marine planation surface at an elevation of about 10 m above mean sea level near light-house at Dwarka also point out a high sea level during the Quaternary. Samples of beach-rock have been collected for radiometric dating.

At Upleta in the river Moj fairly thick (5 m) valley fill miliolite is capping the fluvial deposits. In Districts Junagadh and Porbandar, a valley fill miliolite limestone is seen up to an elevation of 100 m above mean sea level and it is found to be grading into aeolianites at the foot of Barda hills (Porbandar) and at Girnar hills.

Though Lower Palaeolithic tools of Acheulian tradition have been discovered in fluvial gravels underlying the valley fill miliolites in District Junagadh, it is as yet not possible to date this industry precisely due to the absence of suitable material for radiometric dating. Further, the relationship between various littoral, aeolian and fluvial formations is not yet very clear. Tentatively a cultural-stratigraphic correlation can be reconstructed as follows :

geological formation	*cultural finds*	*geomorphic event*	*approximate age**
1. Fanglomerate	Lower Palaeolithic tools	Low sea level	Early Quaternary age (?)
2. High Channel gravels and rubbles	-do-	High sea level	-do- (?)
3. Miliolite formation valley fill type	—	High sea level	-do- (?)
4. Miliolite formation aeolianite	—	Low sea level	-do- (?)
5. Alluvial fills (gravels and silts)	Middle Palaeolithic tools	Gradually rising sea level	Late Quaternary age (30,000 yrs B.P.)
6. Miliolite formation, oyster beds, beach rock, etc.	—	High sea level	25-30,000 yrs B.P. (as based on C-14 dates)
7. Coastal aeolianites	—	Low sea level	Late Quaternary (Closing phase of Pleistocene)
18. Alluvial fills, beach-rocks, coral beds, oyster beds, etc.	Mesolithic and Chalcolithic cultures	Fluctuating sea level	Early Holocene

*Terms Early and Late are purely arbitrary. They only point out imprecise nature of Quaternary time scale.

28. EXCAVATION AT PRABHAS PATAN, DISTRICT JUNAGADH.—In continuation of the previous year's work *(1975-76,* p. 13), the Deccan College Post-graduate and Research Institute, Pune and the Department of Archaeology, Government of Gujarat, resumed excavation at Prabhas Patan, with a view to tracing the extension of the structure complex of the late Prabhas Period *(circa* fifteen hundred-twelve hundred B.C.), which was partly exposed earlier, and to know more about the material equipment of this period.

Excavation in the extended area revealed that the structure was disturbed by the foundation of the walls of rubble stone masonry of the early historical period. However, following observations were made on the stone structure of the late Prabhas Period: (i) the structure was certainly not meant for residential purpose but was a public building as there are no traces of floor, post-holes and any other activity indicative of human habitation. Besides, the size of most of the rooms (1.50 m sq) shows that the area enclosed was not adequate for the purpose of

living. There is also no evidence of any foundation for the stone walls; (ii) in some of the rooms small platforms made of flat stones have been observed; (iii) the evidence suggests that the structure was open to sky and did not have any roof; (iv) the artefacts recovered from within the structure suggest that the structure probably represents a warehouse where the goods were stored.

The result of the study of the fauna! remains from the excavation by Dr G. L. Badam is as follows.

Interesting feature of the collection is that the bones of horse *(Equus caballus)* and fish were found only in the early historical period. Bones of cattle *(Bos indicus),* sheep *(ovis orientalis vignei),* goat *(capra hircus aegagrus)* and pig *{Sus scrofa cristatus)* are found right from chalcolithic to early historical periods, in almost all levels. Bones of camel *(camelus dromedarius)* occur in the chalcolithic and early historical periods. Most of the bones collected belong to the domesticated animals, except two wild examples of Sambar *(Cervus unicolor)* and Chital *(Axis axis).* A few bones of turtles (possibly *Trionyx)* and rodents have also been collected.

29. EXPLORATION IN DISTRICT KUTCH.—Dr G. L. Badam of the Deccan College Post graduate and Research Institute, Pune, Shri Y. M. Chitalwala of the Department of Archaeology, Government of Gujarat and Shri D. K. Vaidya of Kutch Museum, in the course of exploration brought to light a series of sites of palaeontological interest ranging in age from 75 to 200 million years, belonging to Mesozoic age, around Bhuj, at Boladi, Ler, Pitrawala Pir Talao (Kotda Chandrani) and Sugpar.

The sites yielded a diversified assemblage of marine invertebrate fossils, some of them tentatively identified as *Nautilus, Belemnites, Trigonia, Exogyra,* etc. The sites at Pitrawala Pir Talao and Boladi also yielded, for the first time, fossils of marine reptiles, fish and mammals in the area.

Chert, used as raw material for the manufacture of microliths from some Harappan sites in and around Bhuj, seems to have been obtained from the above fossil beds. A megalithic stone-circle was also found at the fossiliferous site at Pitrawala Pir Talao.

30. EXCAVATION AT KARVAN, DISTRICT VADODARA.—In continuation of the last year's work *(1975-76,* p. 15), the Western Circle of the Survey resumed excavation under the direction of Shri W. H. Siddiqi and Dr C. Margabandhu, assisted by Sarvashri N. M. Ganam, D.R. Gehlot and P. K. Trivedi.

Excavation on the northern end of the site exposed a baked brick structure of 12.6 m sq, the outer surface of which was plastered with lime. Built in two phases, the lower phase of the wall was distinguished by large-sized bricks (45X 26 X 6 cm). A structure of 3.15 m sq with floor laid in lime, belonging to the third phase was encountered inside the above enclosure. It is situated to the north of Temple 3 which was exposed earlier, and is found demarcated by a wall of about 25 m long running east-west. Other two structures of 3*10 m sq each, outside the enclosure, were also unearthed (pl. XI A).

Excavation on the extreme south of the site revealed a number of brick walls, running north-south and east-west cutting at right angles, but heavily damaged. The whole structure, which seems to be a later addition, was found to have been raised upon a well-laid out brick-bat flooring interspersed by black cotton soil of about 25 cm thick (pl. XI B).

Excavation in the area west of Temple 3 brought to light rear and side walls of a lime plastered brick structure, which probably represented foundation of a shrine (pl. X B). The structure could not be exposed further east as it underlay the structures of later phase.

The ceramic industry is represented by red and grey, stamped and decorated wares. Red polished ware, though found in small quantity, is represented by sprinklers and spouts. Other finds include copper and lead coins, clay bullae, terracotta and stone beads, terracotta animal figurines, shell bangles and miscellaneous copper objects.

HARYANA

31. EXCAVATION AT DAULATPUR, DISTRICT KURUKSHETRA.—In continuation of the previous season's work in 1969-70, Dr U. V. Singh, assisted by Dr S. P. Shukla, of the Department of Ancient Indian History, Culture and Archaeology, Kurukshetra University, resumed excavation with a view: (i) to obtaining more evidence about the earliest culture; and (ii) to ascertaining the relationship between the late phase of the Harappan and Painted Grey Ware cultures. The excavation revealed a sequence of three cultural Periods.

Period I is represented by a late phase of the Harappan Culture with five phases of structural activity. The structural activity of the Period is represented by walls of baked and half-baked bricks, ovens and mud corn-bins. The antiquities of the Period include : bangles, chisels, fish-hook of copper; wheeled bird and animal figurines, toy cart-wheels, beads, bangles and balls in terracotta; beads, bangles and balls in faience; few steatite disc beads; bone points; shell bangles; and circular and triangular terracotta cakes.

The ceramic industry of the Period is represented by thick red ware showing a mixed assemblage of Pre-Harappan, Harappan and Cemetery H tradition, comparable in some respects to that of Bara. Incised designs and paintings in black formed the decorative elements (pl. XII A).

Period II represented by three structural phases yielded the Painted Grey Ware, coarse grey and red and black-slipped wares. Noteworthy finds of the Period include: terracotta humped bull figurine; vase-shaped beads; ear-studs; discs; toy cart-wheels; and a piece of bone bangle. The upper level of the Period yielded two iron implements.

Period III, belonging to the early historical period, yielded interesting terracotta sealings, including a Yaudheya one bearing a legend in Brahmi characters and a bull figure, and another sealing depicting *svastika* design and trident, and yet another probably with the impression of a ring and a *kukkuta.* The Saivite association with the second seal is beyond doubt. Besides a number of terracotta beads, wheels, balls, animal figurines, discs and stamps, miscellaneous objects of iron, including a sickle, and copper, a few copper coins and numerous beads of semi-precious stones were also recovered.

JAMMU AND KASHMIR

32. EXPLORATION IN DISTRICTS BARAMULLA AND JAMMU.—The explorations Branch of the Headquarters Office of the Survey, under Shri J. P. Joshi, assisted by Kumari Madhu Bala and Sarvashri J. R. Batra, G. Laxminarayana, Vijay Kumar and Manohar Lai, conducted explorations and located neolithic sites at Deoekampura, Kingandara, Kanispura in District Baramulla and early historical sites at Chak Jafar and Kanah Chak in District Jammu.

33. EXPLORATION IN DISTRICT JAMMU.—In the course of exploration, Shri R. D. Singh of the Frontier Circle of the Survey, brought to light ancient sites at Bakor, Kotgarhi and Tibba in Akhnoor Taluk. The site at Kotgarhi yielded sturdy red ware sherds with similar fabric and shapes as obtained from Harappan level at Manda. Besides, a fragmentary terracotta bull was also collected. Other sites are characterized by red ware showing similarity with the pottery of Pambarwan and upper level of Manda. A few sherds of red-slipped ware and black painted red ware, represented by bowls with vertical sharp-edged rim and tapering sides, vases with splayed out rim, lids, jars and basins, were also collected.

34. EXCAVATION AT MANDA, DISTRICT JAMMU.—The Explorations Branch of the Head quarters Office of the Survey under Shri J. P. Joshi, assisted by Kumari Madhu Bala, Sarvashri J. R.Batra, G. Laxminarayana and Manohar Lai, carried out small-scale excavation at

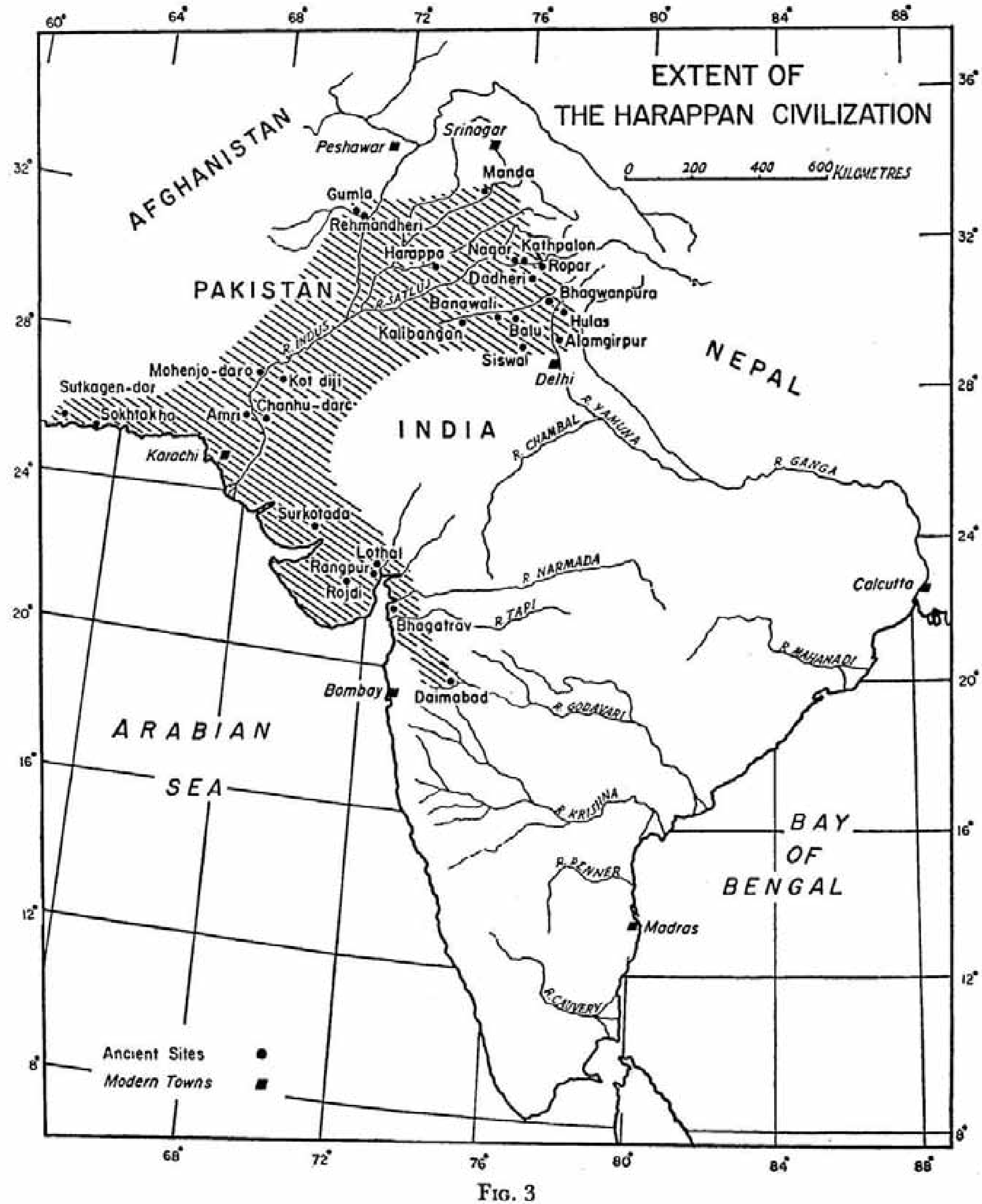

EXTENT OF
THE HARAPPAN CIVILIZATION
0 200 400 600 KILOMETRES
AFGHANISTAN
PAKISTAN
INDIA
NEPAL
ARABIAN
SEA
BAY
OF
BENGAL
Peshawar
Srinagar
Manda
Gumla
Rehmandheri
Harappa
Nagar
Kathpalon
Ropar
Dadheri
Bhagwanpura
Banawali
Hulas
Kalibangan
Balu
Alamgirpur
Siswal
Delhi
Mohenjo-daro
Kot diji
Sutkagen-dor
Sokhtakho
Amri
Chanhu-daro
Karachi
Surkotada
Lothal
Rangpur
Rojdi
Bhagatrav
Bombay
Daimabad
Calcutta
Madras
R. INDUS
R. SATLUJ
R. YAMUNA
R. CHAMBAL
R. GANGA
R. NARMADA
R. TAPI
R. MAHANADI
R. GODAVARI
R. KRISHNA
R. PENNER
R. CAUVERY
Ancient Sites
Modern Towns
60°
64°
68°
72°
76°
80°
84°
88°
36°
32°
28°
24°
20°
16°
12°
8°

FIG. 3

Manda (fig. 3), Aknnoor (Lat. 30°, 54' N, Long. 74°, 48' E), situated about 28 km north-west of Jammu along the river Chenab in the foothills of Pir Panjal range.

The excavation exposed a 9.20-m thick occupation deposit, showing a three-fold sequence of Cultures with a Sub-period in the earliest (pl. XIII A).

Sub-period IA represented by an occupational deposit of 1 .00 to 1 .40 m, is marked by the arrival of the Harappans. The pottery shows two main ceramic traditions: (i) Pre-Harappan red ware (fig. 4) and (ii) Harappan red ware. The Pre-Harappan element is 15 to 25 per cent (fig. 5) in the lower levels but slowly diminishes in the upper. Jars with thick painted band on the neck and shoulder, reminiscent of the pre-defence phase at Harappa, are available besides the rusticated ware. The Harappan pottery consists of red ware, both plain and painted, and includes jars, dishes, dishes-on-stand, beakers and goblets. The perforated jar is conspicuously absent in the assemblage, a phenomenon which perhaps need not be over emphasized due to the limited extent of the excavation. A few sherds of the grey ware were also found. Other associated finds consist of a copper double-spiral headed pin (pl. XIII B), having West Asian affinity, tanged bone arrow-heads, terracotta bangles, terracotta cakes, potsherds bearing incised Harappan script, chert blade, an unfinished seal and a few saddle querns and pestles. Owing to the restricted nature of the dig, no specific structures could be exposed, excepting a collapsed rubble wall.

Sub-period IB, represented by an occupational deposit of 1.60 to 1 .70 m, has two distinct ceramic traditions : (i) Harappan red ware; and (ii) grey ware, generally associated elsewhere with the well-known Painted Grey Ware. The Harappan pottery is represented by dishes, dishes-on-stand and beakers, goblets being absent. The grey ware is represented by bowls (including the straight-sided ones) and dishes. A frequency analysis indicates that among the ceramic industries, the latter forms 7 to 19 per cent of the total yield. Besides, a few sherds of the thick burnished grey were also obtained from these levels. An interlocking of two ceramic traditions is thus clearly indicated.

Period II, with an occupational deposit of 1.70 to 2.00 m, is characterized by the pottery of the early historical period represented by dishes, bowls, *handis* with featureless rim, miniature pots, etc.

Period III, represented by an occupational deposit of 1.70 to 1.90 m, is distinguished by the use of Kushana pottery, some of which is also decorated with incised and stamped patterns which include both vegetal and floral motifs.

The antiquities of the Period include : glass bangles; terracotta objects like horse with saddle, votive tanks, beads, stoppers, birds, figure of a lady, playing on a small drum; bone arrow-heads; stone caskets; iron daggers and arrow-heads; copper antimony rods; a few copper coins; and some stone rotary querns. Amongst the structures of this Period are partially exposed house walls made in rubble diaper masonry, flanked on both sides by a 3-m wide street.

After the Kushana period, the site seems to have been deserted. The various pits, found in the upper levels, are associated with the constructional activity during the eighteenth and ninteenth century, ascribable to Raja Gulab Singh.

KARNATAKA

35. EXCAVATION AT VADAGAON MADHAVAPUR, DISTRICT BELGAUM.—In continuation of the last year's work *(1975-76,* p. 19), the Department of Ancient Indian History and Epigraphy and the Kannada Research Institute, Karnatak University, resumed excavation under the direction of Dr A. Sundara, with a view to exposing the structures.

In Site 2, Trench 7 which initially measured 10 X 15 m was extended further to measure 40 X 30 m. The excavation brought to light the extension of the earlier exposed structure, patches of rammed floor and three circular storage pits. One of the storage pits yielded a thick

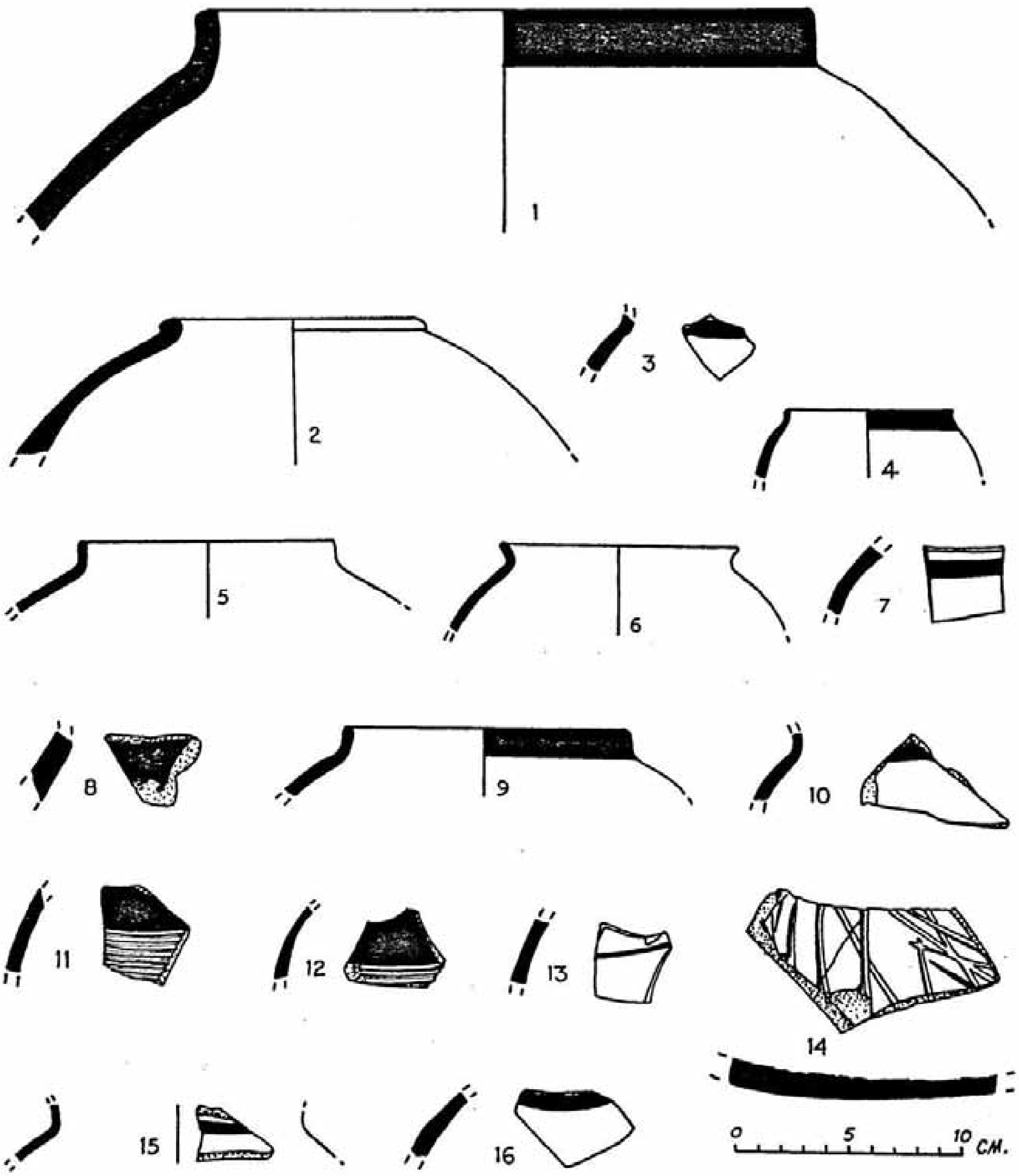


FIG. 4

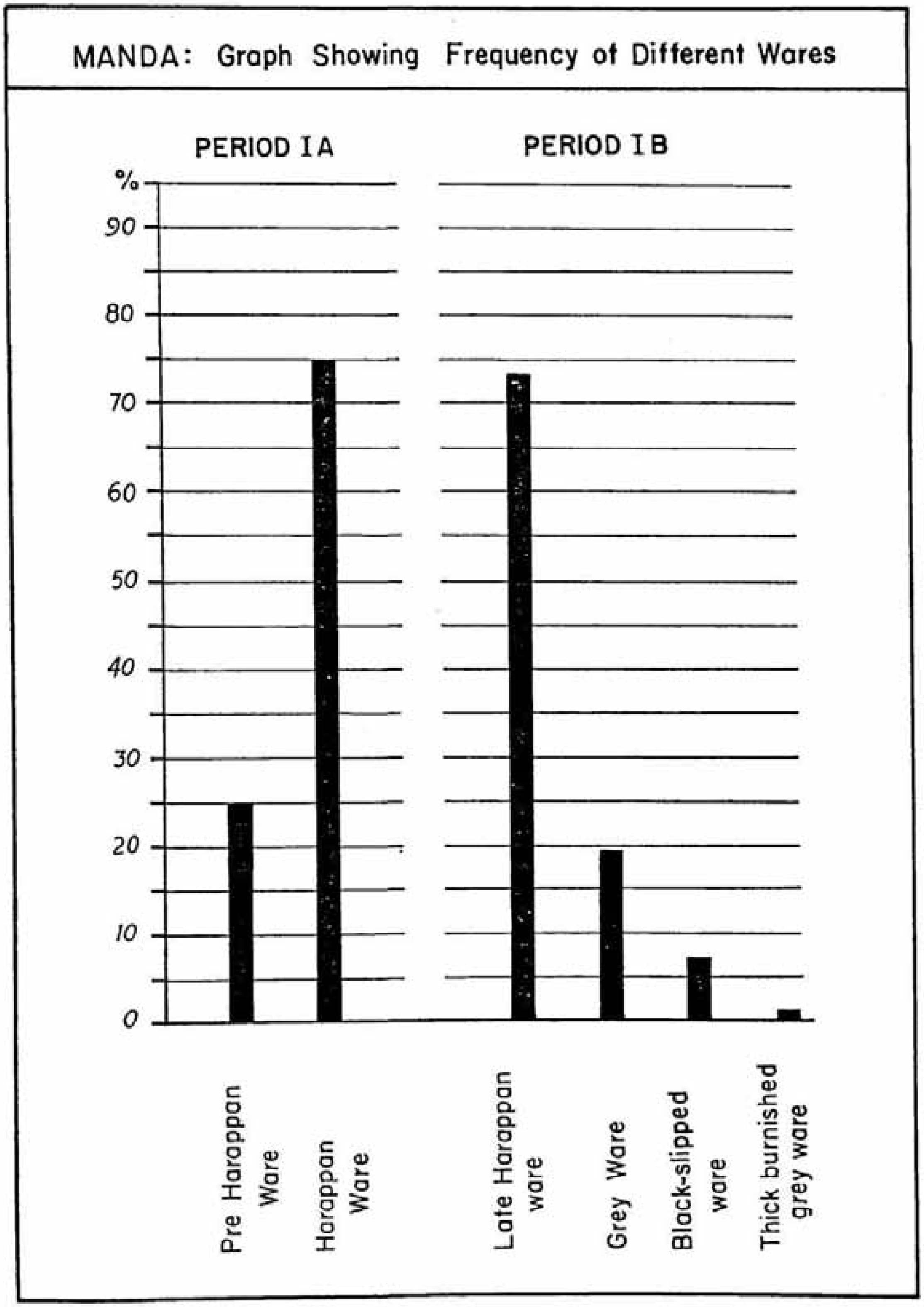

MANDA: Graph Showing Frequency of Different Wares
PERIOD I A
PERIOD I B
%
90
80
70
60
50
40
30
20
10
0
Pre Harappan Ware
Harappan Ware
Late Harappan ware
Grey Ware
Black-slipped ware
Thick burnished grey ware

FIG. 5

copper wire bent into a curious shape and grains of paddy. Excavation in Trench 8 revealed brick walls of a room measuring 2-0 m sq and 1-0 m high, with brick paved flooring. Trench 9 contained two brick-lined storage pits.

In Site 3, in the trench measuring 40 x 8 m, four to five successive floor levels, laid with small pebbles, were encountered.

The antiquities recovered from the excavation include : terracotta areca-nut shaped and spherical beads; copper coins with Ujjain symbol; ivory (?) rectangular pawns of dice, with one, two, three and four circles on the sides; a fragment of a circular terracotta medallion with floral circular bands on one side and a human couple on the other, terracotta elephant heads; a silver Roman coin with effigy of the king's head on one side and the goddess on the other; potin coins bearing the legends *Maharathisa Kurasa, Maharajasa Vilivaya-Kurasa, Rano Gotamiputasa.. .Kurasa,* etc., with bow and arrow and hill and river. Besides, two neolithic celts and a rim of a thick basin having embossed figure of a man driving an elephant are noteworthy.

36. EXPLORATION IN DISTRICTS, BELGAUM AND BIJAPUR.—In continuation of the earlier work *{1974-75* p. 18), Dr R. S. Pappu of the Deccan College Post-graduate and Research Institute, Pune, carried out geomorphic and prehistoric investigations around the Acheulian site of Anagwadi in the Ghataprabha valley. At this site the tool-bearing deposits are associated with the laterite formations which are confined in an area of about 4 sq km between the villages of Anagwadi and Budihal. They have attained a thickness of about 20-25 m above the modern river level (530 m) and occur as slightly elevated high grounds. Chemical studies ($SiO_2Al_2O_3$ ratio) of laterite profiles have shown that the rock is of *in situ* origin. It has been derived from moderately dipping ferruginous shales. The laterite outcrop is older than the late Pleistocene alluvial surface, designated as Krishna surface, which occurs between 550-600 m above sea level in the area and is younger than the late Tertiary Kaladgi surface occurring between 650-700 m above sea level. There is a distinct unconformable relationship between Kaladgi surface and the laterite surface while the late Pleistocene surface and the laterite surface are separated by secondary laterite debris which grades into Acheulian tool-bearing conglomerate at Anagwadi. These geomorphic features thus help to date primary laterite to the early Pleistocene. The climate during the formation of primary was certainly much more humid than the present semi-arid climate. Acheulian man arrived in the area when the laterite surface was in the processes of degradation. The climate gradually became distinctly semi-arid, characterized by storm rains of great intensity. The braided course of the Ghataprabha which was 3 to 5 m above the modern bed level served as a perennial source of water and the Acheulian man there fore temporarily occupied the channels and the adjacent piedmont slopes of the valley pediment. Relative thinness (less than 10 m) of the Pleistocene surfacial sediments and the occurrence of fresh tools in various geomorphic situations suggest that the landscape in the Ghataprabha valley remained fairly static since late Pleistocene time.

Explorations undertaken in the middle reaches of the Ghataprabha and Markandeya in the Gokak Taluk, District Belgaum, brought to light a number of Middle Palaeolithic sites of which those in stratified context are Kolve, Kundargi, Lolsar, Mamadapur and Pacchapur.

37. EXPLORATION IN DISTRICT BELLARY.—Shri S. R. Rao of the Mid-southern Circle of the Survey, discovered a Lower Palaeolithic site, about 6 km south-west of Kamalapuram village. The tools, collected from the deposits of an ancient nullah, include choppers, handaxes, scrapers and varieties of flakes, made of dolerite and worked both unifacially and bifacially. A few cores were also collected from the deposit (pl. XIV A).

Sarvashri B. P. Bopardikar and S. K. Joshi of the Mid-southern Circle of the Survey, during the course of exploration, brought to light two painted rock-shelters around Hampi. Rock-shelter 1 is on the right bank of the river Tungabhadra near Chakrathirtha, where the

river takes a deep curve and flows towards north-east. The painting which may be assigned to the neolithic/chalcolithic period, depicts a gigantic bird pecking at a massive human figure, shown holding some weapon in his hand. Both the figures are decorated with criss-cross designs on the body. At the corner of the sloping boulder a dagger with antennae hilt is shown.

Rock-shelter 2 is situated to the south of the neolithic site at Masalayyana Gudda and the paintings are executed in red colour. The paintings depict both human and animal figures. The animals depicted are bison, antelope, tiger and a humped bull with horns. Another panel depicts stylized human figures in dancing posture. On the basis of typo-technic, the paintings are comparable with those of Rewa and Bhimbetka in Madhya Pradesh.

A small stucco head of an image was collected from the surface near Rock-shelter 1. It is made of lime, small broken stones and other ingredients, and measures 11 cm in height and 25 cm in circumference. It shows a roundish face with a straight nose and a head-gear covering both the ears. The centre of the head is marked by a knot and is decorated with wavy lines.

38. EXCAVATION AT HAMPI, DISTRICT BELLARY.—In continuation of the previous year's work *(1975-76,* pp. 20-21), Shri S. R. Rao, assisted by Shri S. K. Joshi, of the Mid-southern Circle of the Survey, resumed excavation with a view to ascertaining the existence of the palace complex to the south of King's Audience Hall and to tracing the different structural phases.

Excavation in the extended trenches towards south of King's Audience Hall brought to light the extension of the palace buildings in the form of masonry plinths of two structural phases, with underground water channels cut in stone and used for supplying water to all the rooms. Another important discovery is of an inscription written in Kannada characters of thirteenth century A.D.

Ceramic industry of the Period is represented by China ware with floral motifs in various colours, coarse black, red and grey wares. Small stucco objects, depicting both architectural and sculptural motifs, small *Siva-lingas* made on soapstone are some of the important antiquities encountered in the excavation of this season.

39. EXCAVATION AT HALLUR, DISTRICT DHARWAR.—The Director of Archaeology and Museums, Government of Karnataka, resumed excavation at Hallur, with a view to confirming the culture sequence established earlier.

Excavation, besides confirming the earlier cultural sequence, yielded three child burials in single, double and treble urns, ascribable to the chalcolithic phase (pl. XII B), a few varieties of charred grains, terracotta human figurines and gold ornaments. Besides, large number of animal bones have also been unearthed.

40. EXPLORATION IN DISTRICT GULBARGA.—In the course of his field-work, Dr Paddayya of the Deccan College Post-graduate and Research Institute, Pune, discovered a new Acheulian locality (Locality VI) at Hunsgi, lying close to Locality V, excavated during earlier seasons. It is situated 70 m away from the left bank of the Hunsgi nullah and 5 m above its bed, forming a distinct terrace lying beyond the reach of present day floods. A large number of Acheulian artefacts of limestone were found scattered in an area of 2000 sq m of cultivated land. The fresh condition of artefacts proved beyond doubt their primary context.

With a view to ascertaining the existence of a regular tool-bearing horizon, several trial pits (1-Ox 1-0 m) were excavated at the locality. One of these pits revealed the following sequence, from top downwards.

Layer 1 (1 to 25 cm)	—	Disturbed, greyish black soil, containing early historical pottery and animal bones.
Layer 2 (26 to 60 cm)	—	Disturbed, whitish gruss with scattered Acheulian artefacts.

Layer 3 (61 to 90 cm)	—	Undisturbed, whitish gruss yielding a large number of Acheulian artefacts along with limestone slabs, granite pieces as well as nodules of dolerite and quartz.
Layer 4 (90 cm —)	—	Weathered granite, represented by sterile gruss.

Layer 3 thus forms the main Acheulian horizon. It yielded three regular artefacts (one chopping tool, one prepared core and one cleaver flake) along with 39 by-product flakes and chips, some measuring hardly one centimetre in length. In fact, it would appear that this layer forms part of a large living horizon similar to the one excavated at Locality V. In this connection it may be noted that several granite boulders (over 1-0 m in length) were found scattered at this locality. It is very probable that, as at Locality V, the Acheulian folk made use of an open area, formed amidst granite boulders, for camping purposes.

Further, Dr Paddayya discovered a stratified Acheulian site at a place called Chennur, lying about 6 km downstream of Hunsgi. This site is also located on the left bank of the Hunsgi nullah. Here, Acheulian artefacts, made on limestone and chert, were found in a 3 to 4-m thick, cross-bedded bouldery conglomerate of limestone. This deposit was found to extend for a distance of over 100 m along the nullah bank. It was overlain by 1-0 m thick black brown kankary silt. A mesolithic site was discovered on the top of the terrace, formed by this silt. Apart from chert artefacts, fresh water shells were found in abundance at this site.

Dr B. K. Gururaja Rao of the Department of Ancient Indian History and Epigraphy, Karnatak University, in the course of his exploration along the banks of the river Bhima from Wadi to its confluence with the Krishna, a stretch of about 36 km, located Middle Palaeolithic sites at Bhimanahalli, Kaulur, Lingadahalli, Lingeri, Machanur and Thanagundi, yielding flake tools including variety offtakes, points, borers, awls and some doubtful specimens of burins, made of chert, jasper, etc. A few miniature handaxes and choppers were collected from the sites at Bhimanahalli and Thanagundi. It was observed in the section of the river that the implementiferous finer gravel beds overlie limy-kankar deposits which are underlain by the reddish sandstone bed and overlain by the regur or the black clay. The tools are also strewn over the banks of the river along with small-sized pebbles.

41. EXCAVATION AT KALYADI, DISTRICT HASSAN.—Shri S. R. Rao of the Mid-southern Circle of the Survey noticed an ancient copper mine, situated at the foot of a small hill which is north of the present Kalyadi copper mines, with as many as twelve tells of considerable height. Of these one was taken up for trial digging by Shri K. P. Poonacha of the Mid-southern Circle of the Survey, with a view to ascertaining whether the tells were formed anciently, or represent heaps of slag or ruined furnaces. The excavation across the tell showed three layers, of which the topmost is humus composed of burnt blackish earth, the middle one is composed of large quantities of slag and the bottom one contains charcoal, fragments of red ware, slags and burnt earth. The thick potsherds used as refractories have also been encountered in the excavation. It was observed that manganese seems to have been used instead of lime as a flux since the ore is chalcopyrite and consists of iron and sulphide as impurities.

42. EXPLORATION IN DISTRICT NORTH KANARA.—In the course of exploration, Dr A Sundara of the Department of Ancient Indian History and Epigraphy, Karnatak University, noticed many ancient temples, sculptures and a few inscriptions in Ankola, Karwar and Kumta Taluks.

Among the sculptures and temples, the noteworthy are: Buddha seated in *padmasana* on a blossomed lotus seat with *makara* back provided with the pillow *{circa* fifth-sixth century A.D.) at Babrawada near Ankola; two Jaina temples belonging to the middle of the twelfth century A.D., one of Parsvanatha with sculptures of Dharanendra *Yaksha,* Padmavati *Takshi,* Sarasvati

and a Kannada inscription dated to A.D. 1141, as well as two panels of twenty-four *Tirthankaras,* an image of seated *Tirthankara* probably Adinatha in white quartz brought from Jalavalli, and another temple having images of *Tirthankaras,* one of which bearing an inscription, all made of chloritic schist and an image of Chandesvara as locally known but of Padmanidhi at Matta; Mahishamardini of *circa* fifth-sixth century A.D. at Kalave; image of Devi, standing in *samabhanga* holding *khadga* and *sarpa* at Deevalli, two handed Varaha in *samabhanga* holding *bahubijapala* and *gada* at Karve; a Narasimha temple with two sculptures of two-handed Narasimha in *savyalalitasana* holding *matulunga* in the right hand, one of *circa* fifth-sixth century and the other of fourteenth-fifteenth century A.D. at Bengne; *Sarngadhara* Vishnu at Marse; and sculptures of Vishnu in the form of Madhava at Arge, Chandiye, in the form of Govinda at Todura and in the form of Janardhana at Abballi, all belonging to tenth-eleventh century A.D. Besides, sculptures of Ganesa, Naga, *Saptamatrikas,* Yoganarasimha, Kalabhairava, etc. were noticed at various places. Generally, Veera (hero) sculptures of fifteenth-sixteenth century, noticed in Ankola-Kumta area, are shown with bow and arrow or sword. But the one from Vannalli Kumtha is noteworthy as the hero is shown holding *trisula* and *gada.*

The mode of construction of the Narasimha, *Sarngadhara* Vishnu and Ganesa temples respectively at Bengne, Marse and Abballi, is interesting as the walls are built of darkish grey schist stone but into the shape of bricks giving an impression that the temples are built of bricks.

43. EXPLORATION IN DISTRICT RAICHUR.—Shri Ravindra Kori Settar, a research scholar of the Deccan College Post-graduate and Research Institute, Pune, during the course of his exploration along the middle reaches of the Krishna, discovered a number of Middle Palaeolithic sites, associated with high level gravels in Deodurg, Lingsugur and Raichur Taluks of the District Raichur. Subsequently, a few trial pits were dug at Rodalbanda, north-west of Lingsugur, Benukal Konchepli, north-east of Deodurg and Hireraikumpe, north-east of Deodurg, to investigate further the relative age of the Middle Palaeolithic industry. The sites which yielded Middle Palaeolithic toolson the surface are: Chitapur, Rodalbanda (Devaragadde, Malegadde), about 16 km north-west of Lingsugur; Anchesugur, Anjal, Gopalpur, Huvinhudgi, Vagadambli, within a radius of 10 km from Deodurg; Benkal, Domdombli, Karkihalli, Konchepli, Paratpur, situated 13 km north-east of Deodurg; Chigraikumpe, Gugal, Hirerai-kumpe, Itagi, Yatgal, about 30 km north-east of Deodurg; and Deosugur and Yadlapur, 19 km north of Raichur. The Middle Palaeolithic tools associated with the high level gravel are all made of chert, as it forms the predominant component of the gravel. A few discoids and a couple of scrapers of dolerite were collected from Aidhbhavi situated in the Jaldurg Gorge in the Lingsugur Taluk. The tools of the Middle Palaeolithic Age include side scrapers, end scrapers, transverse scrapers, burins, points and discoids as also cores and flakes. Post-Acheulian handaxes and discoidal cores were collected from the bed of the Krishna at Hireraikumpe.

The course of the middle Krishna is controlled by two major points (Jaldurg falls in the upstream and Srisailam Gorge at the confluence in the Tungabhadra) and flows with a meandering channel in a broad shallow valley. Presence of non-paired terraces on the banks of the Krishna probably suggest a gradual lowering of the channel during the Quaternary.

The oldest erosional rock-cut terrace, with a thin (1.0 m) capping of a braid bar gravel occurs at an elevation of about 15 m above the present bed of the Krishna at Hireraikumpe. As there is no marked disconformity between the lower (1.0 m) sterile portion and the upper tool-bearing surface and as there are a good number of rolled tools in the surface collection, there appears to be no significant time gap between the formation of braid bar gravel and the arrival of Middle Palaeolithic man in this area.

The subsequent rock-cut terrace with a capping of bouldery pebbly gravels 80-90 cm thick, is found at an elevation of 8 cm above the bed level of the Krishna at Hireraikumpe. Trial pit dug at this spot, revealed a good number of rolled Middle Palaeolithic tools. It appears that this

gravel terrace at Hireraikumpe is contemporary with the Middle Palaeolithic men and represents a temporary stable phase of the Krishna which had developed a strong ending tendency.

The later valley fill forms a conspicuous land surface in the area. It is 3 m high above the bed level and 0-5 km wide on either banks. This terrace is composed of consolidated gravel bargs in the lower part and calcreted yellowish brown flood silt in the upper part. These valley fill deposits have been subjected to considerable erosion in the later Holocene period and have been replaced by younger fills represented by less calcareous brownish sandy silt and gravel lenses.

On the basis of preliminary field and laboratory studies it appears that the Middle Palaeolithic tools found on higher erosional rock-cut terraces are certainly older than 40,000 B.P. These findings support similar observations made around Paithan in the middle Godavari valley.

KERALA

44. EXPLORATION IN DISTRICTS MALAPPURAM AND PALGHAT.—In continuation of the previous year's work *(1975-76,* pp. 22-23) Professor R. V. Joshi and Shri P. Rajendran, a Research Fellow of the Deccan College Post-graduate and Research Institute, Pune, carried out further exploration in the Districts and discovered a few Stone Age sites at Nilambur and Walayar. Tools from Nilambur include, choppers, varying in size from 13.5 to 7.2 cm across, scrapers, flakes, cores and borer. Choppers which include both unifacial as well as bifacial types, are made on quartz pebbles. Tools were obtained from an erosional terrace of 8 to 10 m and from the gravel in the river bed.

The Walayar collections have come from the alluvial lateritic surface. They comprise microlithic tool-types, made on vein quartz, and are comparable to those found at other sites discovered earlier in north Kerala. Well-developed river terraces were observed on the river Ponnani at Kuttippuram in District Malappuram. Microlithic tools were obtained from the higher lateritic terrace.

MADHYA PRADESH

45. EXPLORATION IN DISTRICT JAB ALPUR.—In the course of his exploration in the Narmada valley, Dr G. L. Badam of the Deccan College Post-graduate and Research Institute, Pune, discovered a number of Late Acheulian and Middle Palaeolithic sites at Bargi, Gopalpur (27 km east of Jabalpur), Chousath-Yogini hill (20 km east of Jabalpur) and Singrampur (Lodha, Ludhau, Phalkoo). The tools were also collected from Tilwaraghat and Jhansighat which arc already well-known prehistoric sites. The tools collected include Late Acheulian handaxes, cleavers and choppers and Middle Palaeolithic scrapers, flakes and points.

At Singrampur, 65 km north-east of Jabalpur, from the gravel and pebble beds along the streams Lodha, Ludhau and Phalkoo, a large number of handaxes, cleavers and scrapers were obtained. At Bargi dam-site, 40 km south of Jabalpur, the section (about 10 m thick) in the cut-off trench comprises, from the bottom, gravel, red clay and yellow silt. Blades, scrapers, cores and flakes of Middle Palaeolithic Age were collected from the section and the river bed.

46. EXPLORATION IN DISTRICT RAIPUR.—During the course of his exploration, Shri R. P. Pandey, a Research Scholar in the Deccan College Post-graduate and Research Institute, Pune, discovered a number of microlithic sites in the upper Mahanadi valley. Noteworthy among the sites are Bagar, Balamdi river, Barbaspur, Bemcha, Bhandora, Borsi, Goalindih, Jalki, Jogideepa Borid, Kudar nullah, Machewa, Nandania, Paragura, Paterapali Mahasamund, Putpura, Sukda, Thakurdaiya Parsada and Turibhatha. These sites are either situated

around Mahasamund town, or on the road sides from Mahasamund to Kasdol. These are open-air sites located on slopes of the hills or on rock surfaces. Some sites are found on the banks of the streams or nullahs in alluvial deposits, away from the hills.

The tools comprise blades, scrapers, lunates, triangles, awls and fluted cores, predominently made on chert, although occasionally chalcedony and quartz have also been used.

47. EXCAVATION AT BHIMBETKA, DISTRICT RAISEN.—In continuation of the last year's work {*1975-76,* pp. 23-24), Dr V. N. Misra, assisted by Sarvashri S. C. Nanda, P. K. Thomas, Makkhan Lai, Y. Mathpal, D. R. Raju and P. R. Kulkarni, of the Department of Archaeology, University of Poona, continued excavation at Bhimbetka.

Shelter II B-33, having opening to the north and west, contained paintings in red and white colours, depicting mostly men riding horse or elephants and carrying spears, or standing with a sword tied to their waist and also older paintings of wild animals on the ceiling. Excavation here yielded a 1.70-m thick occupation deposit, divisible into five layers.

Layer 1, 5 to 10 cm	: Light grey soil over a stone floor. Microliths and plain red and grey potsherds of historical period.
Layer 2, 30 cm	: More greyish and compact than layer 1. At the base of the layer is a stone-paved floor. Geometric microlithic industry of chalcedonic silica. Plain red potsherds of early historical period.
Layer 3, 80 to 85 cm	: Dark clayey earth, very compact and rich in small angular stone debris; extremely rich in microlithic industry; the upper half of this layer contains occasional thin red ware sherds of fine clay, different from those of layer 2; stone querns, rubbers and hammers quite common; small quantities of animal bones, sometimes charred; two human burials (nos. 1 and 2) found in this layer.
Layer 4, 25 to 45 cm	: Light red colour, very compact, mainly composed of fine stone rubble held together by clayey matrix; large stone blocks scarce; microlithic industry begins to decline in quantity; three human burials (nos. 3 to 5) found.
Layer 5, 10 to 20 cm	: Light red to grey colour, clayey and compact, thick lenses of calcium carbonate pellets; no cultural material except for stray microliths near the top; this layer appears to have been formed by the accumulation of water on the uneven shelter floor before the arrival of man.

This shelter has yielded the maximum habitation deposit, showing an evolution in the mesolithic culture. The microlithic industry of layer 4 is characterized by larger blades and bladelets and a lower proportion of finished tools. In layer 3, the industry is richer in quantity. The bladelets tend to be smaller and more symmetrically produced, showing an increased mastery of manufacturing technique. In the upper half of this layer are found thin red potsherds of very fine clay, suggesting contact with chalcolithic communities. In layer 2, the industry begins to decline and the appearance of coarse red potsherds with shapes of early historical period shows further acculturation from settled communities. The deposit of layer 1 is superficial.

Burial 1, found in sq F 5 in layer 3, was highly fragmentary and very poorly preserved. Its orientation was east-west and the body was laid in a crouched position. Only a part of the lower limb bones resting on a flat slab had survived.

Burial 2, found in sq G 5-6 and H 5-6, was laid in an extended position, oriented northeast-southwest, over a bedding of stones and was partially covered with stones. The upper part of the body—skull, scapulae, clavicles and part of the thoracic cage—is missing. A number of stone rubbers and hammers found neatly arranged with the skeleton as also some animal bones were obviously intended as grave goods.

Burial 3, found in sq G 5-6, was laid in east-west direction, with arms stretched parallel to the body and legs folded. It was in a very poor state of preservation. The skull has completely decayed and survives only as a white outline. It was placed over a bedding of stones. Burial 4 was placed parallel to burial 3 and was also provided with a bedding of stones. The legs were folded as in burial 3. Two pieces of charred antler, one of them with sharp oblique cuts at both ends, and a rubber stone, were possibly placed as grave goods were found. Burial 5, found in sq H 5, is a partial burial belonging to a juvenile represented by a jaw, a fragment of the skull and a few other bones.

48. EXCAVATION AT RAISEN FORT, DISTRICT RAISEN.—Shri M. D. Khare, assisted by Sarvashri K. P. S. Bhadoria, B. S. Vyas and D. P. Mishra, of the Central Circle of the Survey, undertook excavation inside the fort with a view to exposing the medieval structures.

The excavation in the eastern part of the fort revealed, besides three rows of cells around the cistern (pl. XV A), another set of rooms further to its north. Three phases of structural activity could be noticed (pl. XV B), of which the uppermost phase is datable to the fifteenth century A.D. The structures are built of random rubble, set in mud mortar, with the walls plastered and floors are paved with stone slabs. A floor of lime concrete around the cistern and in front of rooms and a small drain sloping towards the cistern were exposed. A big hall to the west of the cistern was also exposed (pl. XIV B).

Other important objects unearthed include : a circular stone *(okhali)* with a diameter of 23 cm, another circular stone object of 22.5 cm with a square hole at one end, used for making *chapatis;* copper coins including one of Muhammad Tughlaq, three copper rings and a nail; iron objects such as nails, knife, arrow-heads, needle, rings; fragments of glass bangles; and stone objects like discs, balls, bead, gamesman, pestle, etc. Besides, a head of Vishnu, belonging to the late Gupta period, and other sculptures belonging to the medieval period were collected.

The ceramic industry is represented by red, grey and black wares.

49. EXPLORATION IN DISTRICT SEHORE.—Dr K. D. Banerjee, assisted by Sarvashri D. P. Sharma, K. V. Ramanrao, A. J. Nambhiraju, H. K. Manik, Basheer Khan, O. B. Khobragade and P. B. S. Sengar of the Prehistory Branch of the Survey, continued further exploration and trial diggings in the Lower Middle Narmada and its northern affluents from Shahganj to Rehti in Budhni Taluk in District Sehore, with a view to preparing a trans verse stratigraphic profile for the northern side of the river.

During the exploration of the Bhagner, Kalladoh and other nullahs, a number of Lower Palaeolithic and microlithic sites were brought to light. It was observed that most of the Stone Age sites are situated in between 304 and 334-m contours, which appears to be the early horizon of the Prehistoric man. The generalized stratigraphy, as observed in the nullahs, is as follows, from top to bottom (fig. 6).

1. Blackish clay
2. Brown Red Silt (Microliths)
3. Yellowish Red concretionary clay
4. Fine gravel (Middle Palaeolithic and Microlithic tools)

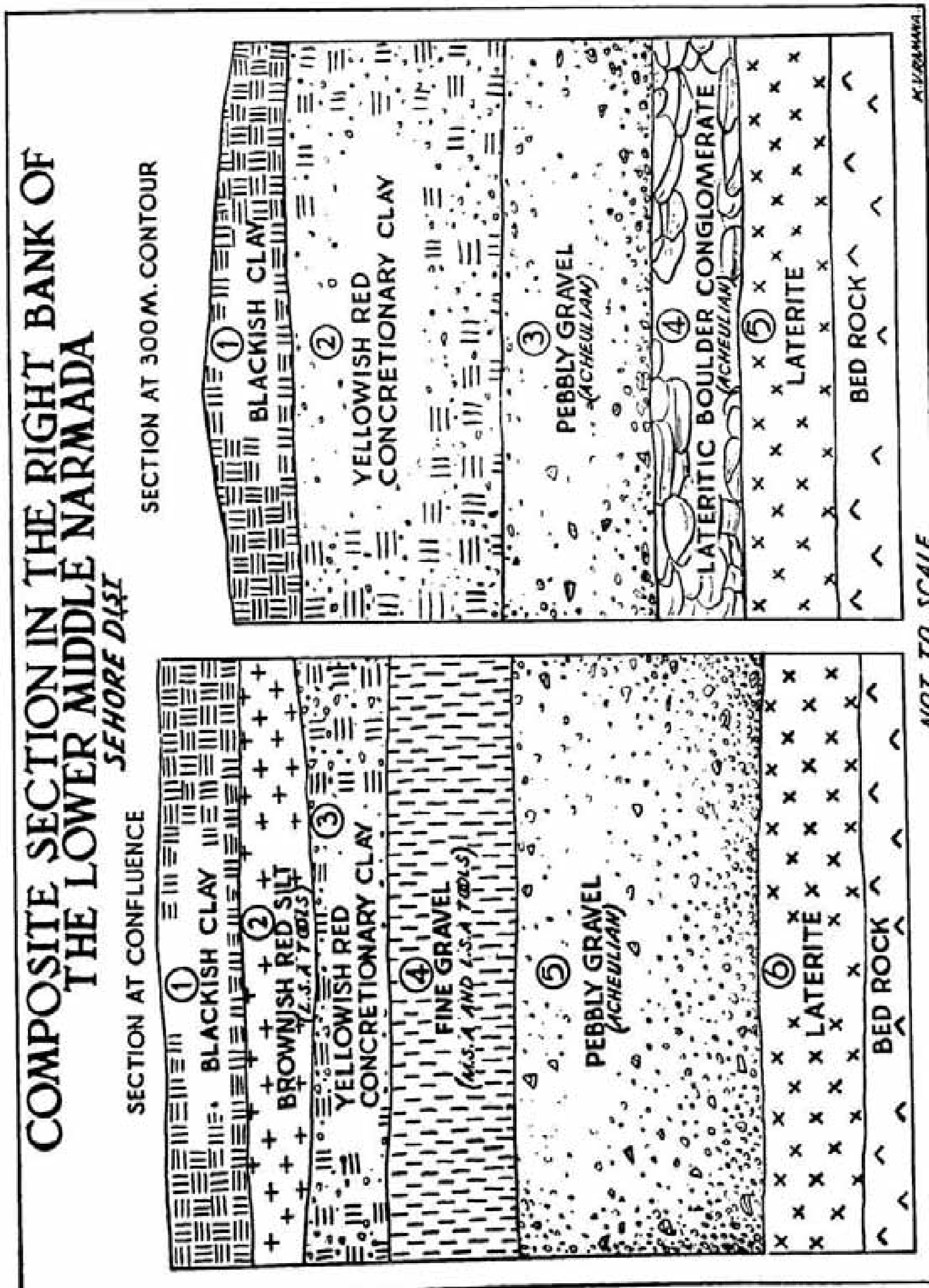

COMPOSITE SECTION IN THE RIGHT BANK OF
THE LOWER MIDDLE NARMADA
SEHORE DIST
SECTION AT CONFLUENCE
① BLACKISH CLAY
② BROWNISH RED SILT
(L.S.A TOOLS)
③ YELLOWISH RED
CONCRETIONARY CLAY
④ FINE GRAVEL
(M.S.A AND L.S.A TOOLS)
⑤ PEBBLY GRAVEL
(ACHEULIAN)
⑥ LATERITE
BED ROCK
SECTION AT 300 M. CONTOUR
① BLACKISH CLAY
② YELLOWISH RED
CONCRETIONARY CLAY
③ PEBBLY GRAVEL
(ACHEULIAN)
④ LATERITIC BOULDER CONGLOMERATE
(ACHEULIAN)
⑤ LATERITE
BED ROCK
NOT TO SCALE

FIG. 6

5. Pebbly gravel (Lower Palaeolithic tools)
6. Lateritic boulder conglomerate (few Lower Palaeolithic tools)
7. Laterite
8. Bed rock (Vindhyan sandstone/conglomerate/quartzite/shales).

Lower Palaeolithic tools, represented by Middle to Upper Acheulian complex, predominantly consisting of handaxes, cleavers, scrapers, cores, flakes, etc., were located at: Sulighati near Budhni on Gadania; Deocolony, Deogaon, Hathidoh (pl. XVI A), Khandabar on Kalladoh; Andikachhar, Gerughat, Patni (pl. XVI B), Satdhara, Talaria on Bhagner; and Guari on the Narmada. Microlithic sites were found at Guari, Patni, Ratanpur, Talaria, Unchakhera, Yarnagar and several other places, all in Budhni Taluk.

Similar sections were observed at several places in the Bhagner and Kalladoh nullahs, also limited to the height between 304 m and 334 m (pls. XVII, XVIII, XIX and XX). The sections are as follows, from top to bottom:

1. Blackish clay (Microliths)
2. Yellowish red concretionary clay
3. Pebbly gravel (Lower Palaeolithic tools)
4. Lateritic boulder conglomerate (few Lower Palaeolithic tools)
5. Laterite
6. Bed rock (Vindhyan sandstone/conglomerate/quartzite/shales)

Another section was observed at Satdhara on the confluence of the Bhagner and Narmada. The section from top to bottom is as follows :

1. Blackish clay
2. Brownish red silt
3. Yellowish red concretionary clay
4. Fine gravel (Middle Palaeolithic and Microlithic tools)
5. Pebbly gravel (Lower Palaeolithic tools)
6. Laterite
7. Bed Rock (Vindhyan sandstone/conglomerate/quartzite/shales)

Lower Palaeolithic tools, collected from pebbly gravel in the section, were rolled, suggesting that the implements were redeposited here from the upper reaches of the stream. The Middle Palaeolithic tools, found in the fine gravel, also appear to have come from the upstream deposits.

An interesting section was also located at Bandra Ban, on the opposite side of the Narmada, at the confluence of the Narmada and the Tawa (pl. XXI A). This site is practically on the Narmada. The section from top to bottom is as follows :

1. Gravel (consisting of boulders, pebbles and yielding Lower Palaeolithic tools)
2. Laterite
3. Bed Rock (Vindhyan sandstone/conglomerate/quartzite/shales).

For the first time laterite in the Narmada section has been noticed in this exploration.

Clearance of debris at Pangoraria (pl. XXI B) revealed an almost intact *stupa* (pl. XXII A). The stave and the *chhatra* (pl. XXII B) seem to have been removed for robbing the casket which apparently lay just below the base of the stave.

The stave is octagonal in cross-section and bears an inscription, suggesting a gift. The *chhatra* is worked to give it an appearance of a lotus. Palaeographically the inscription appears to be of Asokan times.

50. EXPLORATION IN DISTRICT VIDISHA.—Shri M. D. Khare, assisted by Sarvashri M. G. Jhabak and Bholanath of the Temple Survey Project for Northern Region of the Survey, discovered a group of fifty painted rock-shelters in the Ahamadpur hill (pl. XXIII), about 20 km from Vidisha and 2 km north-west of Bilori on the Vidisha-Berasia road.

The hill, running east-west, is about 1200 m long and 550 m wide, having a height of about 570 m above mean sea level. A small river, the Sahodra, a tributary of the Betwa, flows to its south. The southern side of the hillock, which has the maximum number of shelters than the northern, looks like a multi-storeyed construction in an ascending order. The rock-shelters bear paintings of different phases showing superimposition. The earliest phase (pl. XXVA) represents the stick-like human figures (pl. XXIV), while in the subsequent phases, animal figures outnumber the human figures. The latest phase (pl. XXV B) seems to be contemporary with the painted *sankha lipi.* Like the rest of the paintings in the region, the colours used here are green, red, black and occasionally white. The subjects of paintings, which consist mainly of animals in group or hunting scenes, including figures of a few species of extinct animals are also identical. The largest figure of an elephant is about 2-0 m long and 1-0 m high.

A large number of palaeoliths were collected from the slope of the hill; on the south-western slope, however, a microlithic factory site was noticed.

51. EXCAVATION AT BESNAGAR, DISTRICT VIDISHA.—In continuation of the last year's work *(1975-76,* pp. 30-31), Shri M. D. Khare assisted by Sarvashri B. K. Sinha, Narayan Vyas, S. Ramalu, M. Peshwani and B. S. Vyas of the Central Circle of the Survey and Shri S. N. Kesarwani of the Temple Survey Project for Northern Region of the Survey, resumed excavation with a view: (i) to exposing the fortification-wall and the moat; (ii) to completely exposing the temple; and (iii) to finding out more details about the chalcolithic habitation in and around the ancient city.

Excavation in BSN VI revealed that the fortification (pl. XXVI A) was built of random rubble masonry in criss-cross pattern after the wooden palisades. The fortification with a width of 15 m and extant height of 1-0 m, is assignable to the second century B.C. and was found to be resting on a regular habitation of Period III B, yielding punch-marked coins, Northern Black Polished Ware, iron objects, etc. A ramp, made of brick jelly and abutting the fortification wall was also exposed. A number of stone balls, huge and small, were recovered from the the fortification wall and the moat. The inner edge of the moat was strengthened by stone masnory. Two sculptures, one of Siva-Parvati (pl. XXVII A), the other of miniature standing Vishnu (pl. XXVII B), probably belonging to Period IV B, were recovered from the moat. Besides, a torso (pl. XXVII C) and decorated portion of the pillar (pl. XXVII D) were also recovered. Two ring-wells and a number of rubble structures to the east of the fortifications were unearthed. A brick wall of seven courses, plastered with lime, running to a length of 3 m, belonging to Period IV B was also exposed. Important discovery from Period IV A is that of an inscribed seal.

Excavation in BSN VII exposed a temple-complex (pl. XXVI B), assignble to Period IV A. The temple-complex consisted of an apsidal shrine, a four-pillared *mandapa* in front of the shrine on the west and two rooms in the east, enclosed by a rubble wall. The flooring of the complex was made of lateritic clay mixed with potsherds and plastered with lime. The area seems to have been occupied from Period III B. Noteworthy antiquities include a miniature Ganesa, a head of Buddha and a terracotta figure of Kaumari.

Excavation in BSN VIII, which is 400 m from the railway bridge and 4 km from the confluence of the rivers Betwa and Bes, revealed two Periods of occupation, of which Period I is divisible into two Sub-periods, IA and IB.

Period IA is marked by pre-pottery microlithic level. The microliths, found between the depth of 9.00 to 9.25 m from the surface, are made on chalcedony, quartz, jasper and agate, and are non-geometric in form.

Period IB, represented by a deposit of 40 to 60 cm overlying a sterile layer yielded non-geometric and a few geometric microliths without any retouch. No pottery was found in this deposit.

Period II, separated from the preceding Sub-period by a sterile layer of 50 cm thickness is divisible into three sub-phases which yielded material belonging to chalcolithic culture, such microliths, painted black-on-red, white painted black-and-red, fine grey and red wares, post-holes forming circular or rectangular house plans. A few sherds show incised designs and graffiti marks. Painted motifs are represented by horizontal or vertical bands, triangles, cheques, dots, horned antelopes, bulls, etc. Pale brown ware comparable to the neolithic wares of the Deccan is represented by sherds with mat impression on the exterior and burnished surfaces. Some of the grey ware bear paintings in brown pigment.

. The microlithic industry of this period is represented by two traditions, viz., slender ribbon blades of chalcolithic origin and short blades of the neolithic. Other important finds from the period include: terracotta bulls and mother goddess, mostly from lower levels. The sequence of culture obtained in five season's dig is as follows:

Period I A	: Pre-pottery microliths (non-geometric)
Period I B	: Pre-pottery microliths (non-geometric and geometric)
Period II A	: Chalcolithic with three sub-phases (*circa* eighteen hundred to eleven hundred B.C.)
Period II B	: Chalcolithic and Painted Grey Ware (*circa* eleven hundred to nine hundred B.C.)
Period III A	: Pre-Northern Black Polished Ware (*circa* nine hundred to five hundred B.C.)
Period III B	: Northern Black Polished Ware (*circa* five hundred to two hundred B.C.)
Period III C	: Sunga-Satavahana (*circa* two hundred B.C. to the beginning of the first century A.D.)
Period IV A	: Naga-Kushana (first century to third century A.D.)
Period IV B	: Kshatrapa-Gupta (third century to fifth century A.D.)
Period V	: Early Medieval (ninth century to eleventh century A.D.)
Period VI	: Late Medieval-Modern (eighteenth century to early twentieth century A.D.)

MAHARASHTRA

52. EXCAVATION AT DAIMABAD, DISTRICT AHMADNAGAR.—In continuation of the last year's work *(1975-76,* pp. 31-34), Shri S. A. Sali, assisted by Sarvashri V. L. Dharurkar, L. S. Rao, G. K. Mane, V. B. Mathadhikari, D. M. Kulkarni, G. L. Gaikwad, R. S. Trambake and R. D. Ingale, of the South-western Circle of the Survey, under the guidance of Shri M. N. Deshpande, resumed excavation with a view: (i) to confirming the cultural sequence established during the last season; (ii) to ascertaining the chrono-cultural context of the bronze figures found in the year 1974; (iii) to finding out the spread of the settlement of each of the phases; (iv) to exposing fully the rectangular house revealed in plan in the lower levels of the Jorwe phase during the last season; and (v) to excavating horizontally remaining levels of the Jorwe phase in Sector I.

This season's excavation confirmed the sequence of five cultural phases, each distinguished from the other by the occurrence of a distinct class of painted pottery. Excavation indicated that the settlement of Phase I was the narrow strip along the river measuring about three hectares. The largest occupation, however, was that of Phase V, covering more than thirty hectares. The settlements of Phases II, III and IV were spread over an area of about twenty hectares each.

Phase I is characterized by the use of the Savalda Ware, which is made on slow wheel, and has a thick coat of slip on the outside surface, often showing crackles. It is available mostly in chocolate, light red and pink colours. The painted designs, executed mostly in ochre colour

and occasionally in black pigment, include radiating lines, groups of verticals, horizontal bands, notched arrow-heads, saw-like design, arrows, plant motif and birds. The types represented are vase with outcurved rim, *handi-type* vase and vase with short splayed out rim. Associated with this Ware are the burnished grey, thick coarse red wares, besides a small proportion of black burnished ware. Other finds associated with this Phase include: blades and cores of chalcedony; beads of carnelian and trap; and tanged arrow-head made on rib bone. Charred grains of barley and lentil have also been collected from this Phase. The structural evidence consisted of mud-walls, 20 to 30 cm in thickness. However, no complete plan of the houses could be encountered due to the restricted nature of the dig.

Phase II is marked by the occurrence of sturdy Harappan (?) red ware made out of fine clay mixed with small proportion of fine sand as tempering material. It is made on fast wheel. But for a few exceptions, the surface and the core of the ware are uniformly red or brick-red in colour. The ware is treated with a slip and is painted in black with cross-hatched triangles; groups of verticals and wavy lines between horizontal bands; horizontal bands on rim, neck and shoulder; chain pattern; interlaced loops on rim; loops; and plant-like motif. The types represented are vase with oval collared rim, vase with beaked rim, vase with clubbed rim, vase with beaded rim, dish or dish-on-stand and bow). The occurrence of a few sherds of ribbed bichrome ware deserves special mention as it is found at several Harappan sites in Gujarat and Rajasthan. The other associated wares include the burnished grey ware and thick coarse red ware, the latter decorated with incised and applique designs.

The most important find of this season from this Phase is a fragment of red ware bearing three incised letters of Harappan script, on the interior, which confirms that this Phase belongs to the Harappans.

One mud-wall house with 30 cm thick walls, floor plastered with mud was exposed. One of the rooms contained a hearth, 50 cm in diameter.

Noteworthy among the other finds are charred grains of barley, a fragment of a copper/ bronze celt, a bead of gold leaf and microliths of chert and chalcedony.

The excavation in Sectors II and III shows that the site was abandoned for short period as indicated by weathering as well as erosion of the deposit of the Harappan occupation. Dr S. N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, who made the study of the Harappan occupational deposit, is of the opinion that the *in situ* weathering of this deposit has transformed into a light brown soil, immature and pedocalic in characters. Occurrence of highly weathered potsherds on the top of black cotton soil and the presence of a few heavily rolled potsherds of this Phase in the occupational deposit of the succeeding phase support this postulation.

Phase III is characterized by the occurrence of buff and cream ware of medium to coarse fabric, with ashy grey to black core, suggesting imperfect firing, and treated externally with thin buff or cream coloured slip. The painted designs, executed, in black include a series of horizontal bands on the neck, elongated hatched diamonds and triangles, groups of vertical and wavy lines, sun motif and representations of animals, the bodies of which have been filled with stippled lines. The forms represented in this ware include vases, showing; (i) splayed out rim and bulbous body; (ii) high neck and thickened rim; (iii) oval collared or under-cut rim, or squarish rim. Some of the shapes of this ware were available in the ware of the preceding phase. Other wares occurring in this Phase are the white-painted grey, burnished grey and thick coarse red. The white-painted grey ware, is represented by lota-shaped vase with blunt carination, rounded base, slightly concave neck and outcurved featureless rim. The painted designs include groups of oblique and vertical lines especially on the exterior of the rim and neck. This ware is comparable to the white painted black-and-grey ware of Period I of Prakash. The exterior surface of the burnished grey ware, varies in colour from grey to pink and black. The thick coarse red ware is handmade and occurs with or without incised and applique designs.

Among the small finds may be mentioned two small bowls containing beads made of carnelian, milky chalcedony and perhaps coral were recovered. One was containing one hundred and eighteen and the other eighteen beads.

Charred remains of barley, grass pea, horse gram, hyacinth bean, lentil, *moong\urd* (green gram/black gram) and Indian jujube *(ber)* were recovered from this Phase.

Phase IV, which was interlocked with Phase III is characterized by typical black painted Malwa Ware of medium-to-fine fabric, the ware is well fired and treated with a slip which has turned red, orange or pink. The painted designs in black include horizontal wavy lines between horizontal bands on the neck, pairs of oblique strokes on the flaring rim, hatched triangles, horizontal bands on the shoulder, vertical strokes between horizontal bands and loop design besides representation of dog with curved tail and in barking pose. An interesting representation is that of a pair of dogs in united posture painted at the junction of the rim and shoulder. The types met with in this ware are: (i) vases showing incurved sides, vertical neck, splayed out rim; (ii) bowls with slightly incurved sides, blunt carination and convex base; (iii) spouted vases with blunt carination; and (iv) bowls with squat bulbous body and vertical or outcurved rim. Some of the pots also have the so-called potter's marks painted in black, which include dots, a group of three oblique lines and cross, on the exterior and a ladder pattern, a *trisula* below horizontal band and a group of vertical strokes and a U-shaped line on the interior. Associated with the Malwa Ware are the burnished grey and thick coarse red ware.

Belonging to this Phase was a child burial which consisted of three small vases with squat bulbous body and slightly outcurved featureless rim placed in a pit, two of them were placed horizontally mouth-to-mouth of each other, while the third was placed vertically by the side of the other two. Outside these vases were found bones of a child including teeth and phalanges. Seventy beads of bone were also recovered.

The other finds of this Phase include a terracotta humped bull, a perforated terracotta cake, beads of carnelian and bone points. Besides, charred seeds of *ber (Zizyphus jujube* Lamk.), grains of wheat, barley, common pea, grass pea, horse gram and hyacinth bean were also found.

Phase V, which in its lower levels was overlapped with the preceding phase, belongs to the Jorwe Culture. The Jorwe Ware is made on fast wheel and is treated with a slip which has turned red in colour. The slip on the pottery of the lower levels is found to be slightly thicker and brighter than that of the upper level. The painted designs, executed in black, include oblique lines, groups of vertical lines, cross-hatched diamonds, trellis design within horizontal bands, cross-hatched rectangles, loops, etc. Commonest shapes being concave sided carinated bowl with or without spout, high necked jar with beaded rim and globular body, vase with high neck and squatish rim, incurved bowl and *lota*-shaped vase, besides beaker with rounded base and a vase with incurved sides, the latter type occurring frequently in the preceding Malwa Ware. Associated wares include burnished grey, thick coarse red and sun-baked wares.

The other finds include copper bangles, polished stone axes with trapezoid and biconvex cross-section, tiny gold bead, beads of carnelian, agate and bone, sling balls, saddle querns, spindle whorls and a toy-cart wheel made of a potsherd with representation of four spokes engraved on it.

Five structural phases were identified in the occupational deposits. All the houses are oriented southeast-northwest and suggest a systematic layout. The floor of one of the houses was found littered with animal bones, suggesting that this hut might have been used for butchering animals. The walls of the houses were found plastered on either side and thereon treated with lime wash. Another house showing entrances both on the north and south was exposed. The northern entrance, 75 cm wide, flanked by post-holes of 30 cm diameter, has a threshold recessing 20 cm inside the house. The southern entrance was 70 cm wide with a rectangular (55 X 40 cm) step made of rammed clay of 15 cm height, on the outside. On either side of the step was a cylindrical stump of clay of 15 cm diameter over which probably stood

the posts. The floor of the house was well plastered with mud. Within the main room were found a flattish quern lying close to a post-hole in front of the southern entrance and a *chullah* containing ash, charred bones and charcoal pieces. Around the *chullah* were found a painted jar of Jorwe Ware, flat sub-triangular stone, bones, microliths, *kunda-type* vase of burnished grey ware, eight sun-dried vessels with pedestal base, and a concave sided carinated bowl of Jorwe Ware. To the south of the sun-dried vases containing lime, was encountered a room of mud-walls measuring 1.50 X 1.0 m. Inside this room were found a number of bone pieces, charcoal bits and bun-shaped lid in burnished grey ware. A cluster of bones associated with a few microliths and a hammer stone were found near the northern wall. The house had a courtyard plastered with mud, wherein was found a large storage jar of thick coarse red ware. Phase B is represented by Houses 4 and 5 and a circular *chullah.* House 5, a small room with plastered floor, was very much damaged due to later circular pits or silos. One side of the room measured 1.30 m. House 4 was a large structure of wattle-and-daub, oriented almost east-west measuring 4.0 X 4.0 m, having three rooms and well plastered floor. In one of the rooms, probably a kitchen, a rectangular *chullah* and a flat stone in the centre for keeping a cooking vessel, were encountered. Another circular *chullah* was encountered m the open space, some 5 m north of this house. It is made of two concentric walls, varying in thickness from 5 to 10 cm. A flat stone was kept inside the *chullah.* The internal diameter was O.45 m and external was 1.70 m.

Phase G is represented by a number of floors preserved only in patches and post-holes which showed no definite alignment.

Phase D is represented by House 2, a circular hut of 3 m diameter with an entrance of 1-80 m on the south-east. The wall was of compact earth and plastered on either side. The height of the wall was 15 to 20 cm. The floor of the house, plastered with mud, had a number of depressions. A rectangular platform (2.10 X 1.20 m) and five post-holes inside the house and one post-hole at the entrance were also encountered.

Phase E is represented by a platform and mud-strips In the last structural phase were encountered ten clusters of pots, many of which were very badly crushed. The pottery recovered include: *handi*-type spouted and carinated vase, miniature forms of concave carinated and incurved bowls, *lota*-shaped vase, vase with high neck, beaded rim and globular body vase with beaded rim and bulbous body and a beaker with rounded base, in Jorwe Ware pedestalled *lota* with vertical neck, vase with tapering sides and spayed out nm, oval-shaped lamp *kunda*-type vase, bowl with round base and splayed mouth, dish-on-stand, platter and bun-shaped lid in burnished grey ware; and a handmade legged jar of thick coarse red ware with outcurved rim. Other important finds from the clusters include fragments of copper bangles, bone points, blade of chalcedony, two polished hammer stones of trap and two curious sub-triangular stone objects, probably of sandstone which is foreign to the region, ground and smoothened all over and biconvex in section. One of the stone objects has a circular depression on the upper surface.

Preliminary field studies by Dr. S.N. Rajaguru of the Deccan College Post-graduate and Research Institute, Pune, of the gravelly lenses and associated small (½ cm long) gastropod shells found in highly disturbed habitation deposits in the upper levels of the Jorwe Culture suggests that the site was getting submerged under exceptionally strong but short-lived floods of the Pravara during monsoon months.

The charred grains collected from the various phases by using floatation technique were studied and identified by Shri M.D. Kajale of the Deccan College Post-graduate and Research Institute, Pune. Those from the Phase V include wheat (Triticum sp.), barley (Hordeum vulgare Linn), rice (Oryza *sativa* Linn.), Kodon millet (*Kodra* or *Paspalum scrobiculatum* Linn.), Finger millet (*ragi* or *Eleusine caracana* Linn.), great millet (*Towar* or *Sarghum* vulgare Pers.), pearl millet (*Bajra* or *Pennisetum typhoides* Stapf and Hubbard), common pea (*matar* or Pisum arvense Linn.), grass pea (Lathyrus sativus Linn.), horse gram (Dolichos biflorus Linn.), hyacinth bean (Dolichos *lablab* Linn.), gram *{Cicer arietinum* Linn.), lentil *{Lens esculenta* Loench), *moong/urd* (green gram/ black gram or *Phaseolus aureus* Roxb.*Phaseolus mungo* Linn.), linseed *{Linum usitatissimum* Linn.), safflower *(Carthamus tinctorius* Linn.), and Indian jujube *(ber* or *Zizyphus jujuba* Lamk.).

53 . EXPLORATION IN DISTRICT AURANGABAD.—In continuation of the previous year's work *(1975-76,* pp. 34-35), Professor R. V. Joshi, Drs S. N. Rajaguru, R. S. Pappu and Shri A. R. Marathe assisted by Research Scholars Sarvashri Rakesh Pande and Arun Kumar, of the Deccan College Post-graduate and Research Institute, Pune, continued prehistoric and geomorphic investigations in the central Godavari valley within an area of about 200 sq km from Paithan. A series of trial digs were taken up in the Middle Palaeolithic tool-bearing high-level gravel bed near the villages of Waghadi and Wadoli situated 5 km east of Paithan. These studies have brought to light the following important aspects of the Godavari valley during the Quaternary.

The high level gravel with a thickness of about 1.0 to 1.5 m rests on the weathered basalt. It represents an abandoned channel of ancient braided Godavari flowing 20 m above the present bed. The traces of this old channel are preserved in the form of moderately consolidated boulders, cobbles, pebbles and sands of chert, chalcedony and basalt. Gravel analysis has shown that there are two sets of components in the gravel bed. The bigger components (larger than 5 cm) are of siliceous minerals like chert, jasper and chalcedony and are angular to sub-angular in shape. These have been contributed to the main stream by northerly flowing tributaries of the Godavari, originating at a distance of about 35-40 km from Paithan. The smaller components (size : 2-4 cm) are mostly composed of trap pebbles and are subrounded to sub-angular in shape. These have been mainly contributed by the main stream of the Godavari and also by its southerly tributaries. The Middle Palaeolithic cultural material is embedded in the top 30-40 cm of the gravel bed while the rest of the deposit is culturally sterile.

The Godavari got rejuvenated and deepened its valley in the Deccan trap by about 25 m. The rejuvenation was followed by the ubiquitous aggradation phase represented by the alluvial fill terrace, 12 to 15 m high.

The alluvial fill in the form of consolidated gravel with a thickness of about 10-15 m from the present bed is represented on the left and right banks of the Godavari at Navgaon and Borgaon respectively, places situated 16 km south-east of Paithan. The fossilized limb bones of an elephant *(Elephas maximus)* along with fresh as well as rolled Middle Palaeolithic tools were recovered from the gravel bed at Borgaon. The tool-kit consists of varieties of scrapers, borers and points made on multi-coloured siliceous minerals like chert and jasper. On the basis of a single C-14 date on shells, obtained previously from the alluvial fill on the left bank of the Godavari at Paithan, and of the presence of *Elephas maximus* in the fill a late Pleistocene age for the fill is suggested.

The comparative study of the high level gravel and late Pleistocene conglomerate undertaken has shown that the former is strongly weathered as evidenced by (i) obscured lamination, (ii) decalcification of gravel, (iii) weathering of trap sand into *muram,* (iv) strong chemical alteration of zeolites into powdery form, and (v) presence of weathering rind of 3-5 mm thickness in majority of basalt pebbles.

The weathering characters of the high level gravel indicate that it is of considerable antiquity and is older than late Pleistocene fill. As there is no disconformable relationship between the culturally sterile lower part of the gravel and as there are good number of rolled Middle Palaeolithic tools in the upper gravel, the Middle Palaeolithic tools appear to be contemporary with the end phase of the gravel deposits. It is, therefore, concluded that the Middle Palaeolithic tools found in the upper part of the high level gravel are older than late Pleistocene and possibly earlier than 40,000 years B.P.

54. EXCAVATION AT APEGAON, DISTRICT AURANGABAD.—The Deccan College Post graduate and Research Institute, Pune, conducted excavation at Apegaon in Paithan Taluk, under the direction of Professor S. B. Deo, assisted by Drs Z. D. Ansari and M. K. Dhavalikar, with a view to determining the stratigraphic relation of a distinctive ware which was noticed along with the Malwa and Jorwe Wares in the exploration. A small habitational mound, called Ramatirtha on the left bank of the river Godavari, having an occupational deposit of about 3 m was taken up for excavation. The excavation revealed three cultural periods.

Period I *(circa* eighteen hundred to sixteen hundred B.C.) is represented by a distinctive pottery, called for convenience as Ramatirtha Ware (pl. XXVIII A), which was medium thick, with black-brown core and a blackish-brown slip, bearing mostly linear paintings in red. The shapes were limited, resolving themselves into small *handi,* globular pots with flared-out rim and rimless bowls. This ware also showed quite a range of differential firing as a result of which some sherds had turned pale red and the painting dark red. Remains of patches of lime-plastered floor with post-holes were encountered in this period (pl. XXVIII B).

Period II *(circa* sixteen hundred to thirteen hundred B.C.) showed 1-50 m thick deposit. It was represented by successive lime-plastered rammed earth floors in which wooden posts were sunk. Associated with these was a considerable amount of Malwa Ware with all its typical shapes and paintings. In the earlier levels of the Malwa horizon were found large quantities of burnt lentil, pea, wheat, barley, horse gram, green and black gram and Indian jubube. Obviously agriculture seems to have been the mainstay of the economy of this period. Along with the Malwa Ware were found microliths. No copper was found.

Period III, which in its lower levels overlapped with the preceding period, belongs to the Jorwe Culture *(circa* thirteen hundred to one thousand B.C.). The pattern of houses remained unchanged. In this horizon were found common pea, hyacinth bean and Indian jujube.

The excavation has thus given evidence of a culture stratigraphically prior to the Malwa, the pottery of which is similar to the one reported from the earliest occupation at Daimabad. On the basis of the known C-14 dates for the Malwa and the Jorwe cultures, the first occupation at Apegaon may be dated to *circa* eighteen hundred-sixteen hundred B.C.

55. EXCAVATION AT MANDHAL, DISTRICT NAGPUR.—In continuation of the last year's work *(1975-76,* p. 36), the Department of Ancient Indian History, Culture and Archaeology, University of Nagpur, resumed excavation under the direction of Professor Ajay Mitra Shastri, assisted by Drs A. P. Jamkhedkar, H. N. Singh and G. B. Deglurkar, with a view: to tracing the extent and nature of the two structures exposed earlier, and to exposing another structure over a natural hillock.

Excavation revealed that the two brick structures exposed earlier represent remains of temples datable to the Vakataka period (fourth-fifth century A.D.). One of these temples at BHK I was raised on a rectangular platform, measuring 18.0 10.60 X 1.20 m. In the middle of the platform were found traces of what appears to have been a small shrine, represented by an altar (2'10 x 0-95 m) with three courses of bricks, a semicircular brick platform to its west and a fragment of a wall possibly going round the altar. A flight of steps on the north leading to the platform, a brick-built cistern (2.30 X 2.50 X 159 m) on the east of the platform and a couple of brick chambers on the west were also exposed.

Remains of another brick temple were uncovered at MDL II. Originally built of massive brick walls, it was first reconstructed in the late Vakataka period or shortly thereafter. Once again, around twelfth century A.D., it was provided with rubble wall raised on the remains of the earlier stone wall.

Excavation in BHK II, a small hillock locally known as Bongi Hudki, brought to light remains of yet another temple. The temple, built on a massive platform (11.70 X 14.70 m) had a *garbhagriha* (4.50 X 5.60 m) and *mukha-mandapa* (4.00 X 3.30 m).

A number of disturbed megalithic stone circles were also noticed around Mandhal. One of them was excavated and found to be a fractional burial.

MEGHALAYA

56. EXPLORATION IN DISTRICT GARO HILLS.—Drs T. C. Sharma, H. C. Sharma and Shri S. K. Roy, of the Department of Anthropology, Gauhati University, explored the area around Simsanggiri and Siju on the river Simsang.

Around Simsanggiri, presently known as William Nagar, a number of river sections and terraces were observed. Simsanggiri I, a cliff section of the river, 12 to 15 m away from the P.W.D. Inspection Bunglow, has claystone of Eocene period as bed-rock which is overlain by a cemented pebbly and sandy gravels. The size of the gravel varies from boulder to fine gravel, which indicate the gradation of the gravel layer. The gravel is extensive without having any uniformity in thickness. These gravel layers have not yielded any cultural remains. At some places, the bed-rock is overlain by a brownish silt layer.

Simsanggiri II, a section exposed along the Simsang-Nangal road, lying to the south of a stream known as Wakkong, which remains almost always dry except during monsoon, shows the top layer of 2 m thick deposit of reddish brown silt. However, a patch of sand at a depth of 1.70 m at the eastern end of the section and a patch of blackish earth at the western end, were noticed in this silty layer. A layer of pebbles underlies the silty layer, followed by reddish clay deposit of 30 cm, resting over whitish clay.

The maximum altitude of the Siju cave and its neighbourhood is approximately 609 m from the mean sea level. The limestone formation at Siju area was developed during the lower part of the Middle Eocene period. Topography of this area is formed by highly serrated hills with narrow valleys and deep gorge. The river Simsang flows through the steep limestone hills and forms terraces on either banks at different places. Near the cave known as Dabakhol (meaning 'abode of bats' in Garo dialect) the river has cut a V-shaped valley which has widened further south. The cave is very large and extensive. Formations of stalactite and stalagmite were noticed inside the cave. No material indicating human activity inside the cave was recovered. However, on the slope of the hill, between the cave and the Siju village, a number of implements such as handaxes, flakes and cleavers, made on limestone along with a chopper on dolerite pebble and a neolithic celt made on fossiliferous limestone, were collected. The workings on the implements are obliterated due to the nature of the raw material.

ORISSA

57. EXPLORATION IN DISTRICT CUTTACK.—The Department of Archaeology, Government of Orissa, conducted exploration in the area from Kendupatna to Salipur on the river Chitrotpala, and brought to light many sites yielding sculptures, such as Avalokitesvara, Manjusri, Tara, miniature images of the Buddhist pantheon, besides a number of Buddhist images with inscriptions, datable to the ninth-tenth century A.D. Subsequent trial digging at Bramhabana yielded many brick structures including *adhishthana* of a temple.

58. EXCAVATION AT KURUMA, DISTRICT PURL—Shri P. K. Ray of the Department of Archaeology, Government of Orissa, conducted trial excavation at Kuruma which had yielded images of Avalokitesvara, Heruka and a number of terracotta plaques. The excavation revealed some brick structures inside a compound wall, measuring 29 X 20 m, at a depth of 2 m. The ceramic industry is represented by red ware. A terracotta round tablet engraved with Buddhist *dharani* was also collected from the excavation. The structures may be dated to *circa* ninth-tenth century A.D.

PUNJAB

59. EXPLORATION IN DISTRICTS AMRITSAR, FARIDKOT, GURDASPUR, HOSHIARPUR, JULLUNDUR AND PATIALA.—The Explorations Branch of the Headquarters Office of the Survey, under Shri J. P. Joshi, assisted by Kumari Madhu Bala, Sarvashri J. R. Batra, G. Laxminarayana and Manohar Lai, carried out exploration and also re-examined some of the earlier explored sites.

In District Amritsar, Painted Grey Ware and a few late Harappan sherds were found at Gharinda, situated west of Amritsar towards the Attari border. In the northern part of the District no site yielding the Painted Grey Ware was located.

In District Faridkot, Painted Grey Ware, grey ware and late Harappan ware were found at Sosan. In District Gurdaspur, the following sites yielded grey ware and late Harappan pottery: Gurdas Nangal Da Theh, Hardo Rawal Khurd, Haripur and Lohgarh.

In District Jullundur, Painted Grey Ware, grey ware and late Harappan wares were found at Apara, Chini Kanjri Da Theh and Haripur. In the north-western side of the same District, grey ware, black-slipped ware were found at Karalan, Kartarpur and Malsian. The following is the list of the explored sites indicating their cultural assemblage.

(LH=Late Harappan; PGW=Painted Grey Ware; BW= Black-slipped ware; GW=Grey ware; EH—Early historical; and Med= Medieval)

District	*Village/Site*	*Cultural assemblage*
Amritsar	Attari	Med
-do-	Chhina	LH, PGW, GW, BW
-do-	Gharinda	PGW, GW, BW, Med
-do-	Neshta	Med
-do-	Pucca Pind	Med
-do-	Ramthirth	GW, EH, Med
Faridkot	Sosan	LH, PGW, GW, BW, EH
Gurdaspur	Budhenangal	GW (?)
-do-	Bukhariwal	GW, PGW, Med
-do-	Gagar Bhana	Med
-do-	Gurdas Nangal Da Theh	LH, GW
-do-	Jagaria	LH, GW
-do-	Kalanaur	GW, Med
-do-	Kanva	LH, PGW, GW, BW, Med
-do-	Lohgarh	LH, GW
-do-	Neevan Dhakla	EH
-do-	Paniar	Med
-do-Hos	Sanamepur Raian	GW, Med
hiarpur	Ram Colony Camp	EH
-do-Jullu	Sham Chaurasi	EH, Med
ndur	Chini Kanjri Da Theh	PGW, GW, BW
-do-	Haripur	LH, PGW, GW
-do-	Karalan	LH, GW, BW
-do-	Kartarpur	PGW, GW
-do-	Malsian	LH, GW, BW
-do-	Rahon	LH, EH, Med
-do-	Uccha Lutera	PGW, GW
-do-	Nauli	LH
Patiala	Rajgarh	LH, PGW, GW

60. EXPLORATION IN DISTRICT HOSHIARPUR.—The Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, conducted exploration in Dholbaha region, and brought to light Lower Palaeolithic sites at Atvarapur, Khangali, Naroor, Ram Tatwali, Rehamanpur and Takhani.

The site at Atvarapur yielded handaxes, cleavers, scrapers, cores, choppers and flakes, whereas Rehamanpur yielded all the above mentioned types except scrapers and cores. But the site at Takhani yielded only cleavers and choppers. The tools collected from the remaining sites include chopper-chopping tools made on pebbles.

61. EXCAVATION AT KATHPALON, DISTRICT JULLUNDUR.—The Explorations Branch of the Headquarters Office of the Survey, under Shri J. P. Joshi, assisted by Kumari Madhu Bala and Sarvashri J. R. Batra, G. Laxminarayana, Vijay Kumar and Manohar Lai, undertook a small-scale excavation at Kathpalon (Lat. 30°05' N, Long. 75°52' E) and brought to light a sequence of three cultures in an occupation deposit of 6 m. In Period I, the Painted Grey Ware Culture was found interlocked with the late Harappan Culture. An oval structure in a dilapidated condition, was found in the associated strata. Other finds include copper antimony rods, terracotta beads and wheels.

This Period, after a break, was followed by Kushana occupation, labelled here as Period II, and represented by typical pottery, beads and animal figurines.

Period III belongs to medieval times, as represented by pottery, terracottas and beads. The strata, however, are very much disturbed by pits, including modern graves.

62. EXCAVATION AT NAGAR, DISTRICT JULLUNDUR.—The Explorations Branch of the Head quarters Office of the Survey, under Shri J. P. Joshi, assisted by Kumari Madhu Bala, Sarvashri J. R. Batra, G. Laxminarayana, Vijay Kumar and Manohar Lai, carried out excavation at Nagar (Lat. 31° 05' N, Long. 75° 50' E) and brought to light in a 5-m cultural deposit, a three fold sequence of cultures. Of these, the lowest, Period I, is represented by the use of Painted Grey Ware with a sprinkling of late Harappan sturdy red ware, again indicating the inter locking of the two cultures. Copper objects, bone styluses, terracotta ear-ornaments, animal figures besides heads and bangles formed the other finds (pl. XXIX C). Two oval structures made of burnt earth, similar to those found at Dadheri, were also exposed in the levels of this Period. People were living in circular huts, half segments of which were fouud in the excavation, as attested by post-holes.

Period II is represented by the typical Kushana pottery, terracotta figurines and coins. At the end of this Period, an early Gupta deposit was attested which is very much disturbed by the medieval period pits. A significant discovery from this deposit is a terracotta seal with the legend *Sri Maka-senapati Ramguptasya* in second-third century Brahmi characters (pl. XXIX B). Besides six floor levels, no other structure of the Kushana period is available in the present small-scale excavation.

Period III represented the prosperous habitation of early medieval times. Mud-brick walls of a house-complex, belonging to this Period, were exposed (pl. XXX A). Beads of semi-precious stones and glass and terracotta animal figurines including that of a horse are other finds.

63. EXPLORATION IN DISTRICTS LUDHIANA, PATIALA AND ROOPNAGAR.—The Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, conducted exploration in the central basin of the river Ghaggar and brought to light the following sites.

(LH=Late Harappan; PGW=Painted Grey Ware; GW=Grey ware; EH = Early historical: EM=Early Medieval; and M— Medieval)

District	*Village/Site*	*Cultural assemblage*
Ludhiana	Badla	LH
-do-	Barwali	LH, EH
Patiala	Alipur	PGW
-do-	Dudhan	GW, EH
-do-	Guthmura	GW, EH
-do-	Kasba	EH
-do-	Kheri Gajjuan	LH, PGW
-do-	Machhingan	GW, EH
-do-	Manghal	EM
-do-	Nagawan	LH, PGW
-do-	Safera	M
-do-	Shamdu	PGW, EH
-do-	Surkada	GW, EH
-do-	UchaKhera	LH
Roopnagar	Kubaheri	LH, EH
-do-	Pallanpur	LH

64. EXCAVATION AT DADHERI, DISTRICT LUDHIANA.—With a view to further confirming the interlocking of the Painted Grey Ware with the last phase of the late Harappan Culture, as recognized at Bhagwanpura, District Kurukshetra *(1975-76,* pp. 16-17), an excavation was carried out at Dadheri (Lat. 30° 40' N, Long. 76° 15' E) by the Explorations Branch of the Headquarters Office of the Survey, under the direction of Shri J. P. Joshi, assisted by Kumari Madhu Bala and Sarvashri J. R. Batra, G. Laxminarayana, Vijay Kumar and Manohar Lai. The excavation indicated that the Painted Grey Ware Culture, in its earlier stages, was interlocked with the late Harappan Culture at this site, thus confirming the evidence found at Bhagwanpura. The excavation revealed a three-fold sequence of cultures called Sub-period IA, Sub-period IB and Period II (pl. XXX B).

Sub-period IA marks the earliest settlement at the site by late Harappans who built a settlement consisting of mud-walled houses over solid rammed mud platforms. A 59-cm thick mud-wall, running in east-west direction, was exposed to a length of 1.70 m. Besides, post-holes were also found in the excavated area suggesting the existence of huts of wattle-and-daub. The pottery is represented by a sturdy red ware both painted and plain, the shapes met with being jars, dish-on-stand, etc. The design repertoire consists of horizontal bands, criss-cross patterns, filled in arches and hatched lozenges, etc. A large jar, having painted and incised design (pl. XXIX A), is one of the most fascinating finds from this level. A considerable amount of incised pottery, having a pre-Harappan lineage was also found. Other finds include faience bangles; terracotta wheels, beads, a painted bull; copper objects; beads of carnelian and lapis-lazuli.

Sub-period IB revealed interesting evidence of the house-types of the Painted Grey Ware Culture. At first the people were living in semicircular huts (perhaps made of wattle-and-daub) as attested to by the discovery of post-holes. Three oval structures of burnt earth were also exposed from this Sub-period. These structures had probably a domical roof as evidenced by the collapsed material found inside the structures. In the next stage, the houses were built of mud-walls. A complete room, measuring 1.10 X2.50 m, of a house-complex was exposed. The last phase is represented by a wall made of baked brick-bats and brick-jelly. Two sizes of

bricks with finger impression have been found : (i) 12 X 12 X 7 and (ii) 25 X 20 X 5 cm. The pottery obtained from the occupation strata of this Sub-period comprises Painted Grey Ware, grey ware, black-slipped ware and associated red ware, together with late Harappan ware. The percentage of black-slipped ware is much more than that found at Bhagwanpura in similar context.

The site seems to have been deserted thereafter. However, a few sherds of the Kushana pottery were found on the top level but no regular habitation as such could be discerned in the present excavation.

Period II, represented the occupation of the site in medieval times, as indicated by a few sherds of the glazed ware and red ware. Some of the shapes met with include knife-edged bowls, incense burners, jugs and spouted vessels. Terracotta animal figurines, ear ornaments, beads, wheels and gamesmen are the other finds from this Period.

65. EXCAVATION AT GHURAM, DISTRICT PATIALA.—The Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab, under the direction of Miss Ravneet Kaur, assisted by Sarvashri S. S. Talwar, G. B. Sharma and Manmohan Kumar, carried out excavation at Ghuram (pl. XXXI A), spelt as Kuhram in *Ain-i-Akbari* and other Persian sources. The main objective of the excavation was to find out the sequence of cultures in the central Ghaggar basin. Four trenches, each measuring 6 x 6 m, on the south-eastern side of the site and four trenches across the defence-wall were taken up for excavation (pl. XXXI B). The excavation yielded a four-fold sequence of cultures with three sub-divisions in Period I and two in Period II and two in Period III.

Period IA *(circa* sixth century to fourth century B.C.) is represented by grey ware of medium to fine fabric, types represented being bowls and dishes. Other associated wares are thick, handmade micacious grey and red wares. Antiquities recovered include terracotta beads and bangles, bone styluses and a few iron pieces.

Period IB *{circa* fourth century to third century B.C.) is marked by the appearance of the Northern Black Polished Ware and associated wares.

Period IC *{circa* third century to second century B.C.) represented by a deposit of 1-20 m is distinguished by the occurrence of the black-slipped ware. Mud structures were encountered in this level, among which an oblong structure built of bricks (31 X 20 X 7 cm) was noteworthy. Other important finds include: beads of semi-precious stones, shell and terracotta; and terracotta animal and human figurines, including a figurine of a lady in nude.

Period IIA *(circa* second century to first century B.C.) assignable to the Audumbara period, is represented by a 6.25-m thick deposit which yielded Audumbara coins, such as Vismitra standing on the obverse and elephant walking to the left with legend *Arya-mitasya* and *Indra-mitasya* in Kharoshti characters. Coin-moulds of Menander with bust of the king on the obverse and Athena hurling thunderbolt on the reverse, a silver coin probably cast from the similar mould, were also recovered. Occurrence of these coins and moulds corroborates the literary reference in *Brihat Samhita* that the Audumbaras and Kapisthalas were living in these areas. It is interesting to note that Kaithal which was probably associated with Kapisthalas is adjacent to this region.

Three structural activities have been identified of the period. Structures built of mud-bricks (pl. XXXII A), including one house probably belonging to a goldsmith, large storage jars, corn-bins and a sealing with legend in Brahmi characters of first-second century B.C. were recovered from the associated levels of these structures.

Period IIB *(circa* first century B.C. to first century A.D.) is marked by the occurrence of incurved bowls and pottery with stamped designs (pl. XXXIII A). However, Kushana coins were conspicuous by their absence. The area seems to have been abandoned during first or second century A.D., the reasons for the desertion remaining unascertained.

Period IIIA belongs to the early medieval period, represented by the fortified township. The evidence of this Period is also confirmed by the finds of sculptures of Seshasayi Vishnu (pl. XXXIV A), carved pillars (pl. XXXIV B) and many fragments of sculptures found during explorations. Period IIIB represents the early medieval and Period IV the Mughal period.

During the early Muslim period the official residence of the governor was inside the fortification as evidenced by the remains of water channels (pl. XXXII B) for storing water for purposes of cooling the rooms. Around A.D. 1710, Banda Bahadur attacked Ghuram and razed it to the ground. In the upper levels were found some butchered bodies lying helter-skelter.

Noteworthy finds collected from the surface of the mound include a few sherds of the Painted Grey Ware and late Harappan sherds and a terracotta piece with legend *Ghvam kruma* in Brahmi characters probably of Gupta period (pl. XXXIII B).

RAJASTHAN

65. EXPLORATION IN DISTRICTS AJMER AND JAIPUR.—Drs V. N. Mishra, S. N. Rajaguru and Shri P. K. Thomas of the Poona University and the Deccan College Post-graduate and Research Institute, Pune, in collaboration with Shri Subrata Sinha and his colleagues of the Quaternary and Environmental Geology Division of the Geological Survey of India, Jaipur and Dr Gurdip Singh of the Australian National University, Canberra, carried out preliminary survey, as a part of the multi-disciplinary project on the 'Early Man and his Environment in north-western India with special reference to the Luni Basin in Rajasthan'. The field studies were concentrated around Sambhar and Pushkar lakes and in the Luni valley at Nand and Govindgarh in District Ajmer and at Benara in District Jaipur.

The field work showed that there are well developed pre-Pleistocene peniplain surfaces in the area and the streams flowing over them have widely winding courses in broad shallow valleys. From the bore hole data obtained at Sambhar lake it appears that the early Quaternary (?) formations are fluvial and fluvio-lacustrine in origin and there is no evidence of strong aeolian activity during that period.

Exposed fluvial sediments in the upper reaches of the Luni and the aeolian sediments (mostly various types of dunes) in the area do not appear to be older than the late Quaternary. There are mainly two generations of dunes present in the area. The older dunes are brownish to reddish brown in colour, moderately weathered with a conspicuous development of prismatic peds and with the occurrence of illuvial carbonate horizon at depths varying from 2 to 3 m or little more. These dunes are supposed to be resting on fluvial sediments.

Rich Mesolithic sites were located on the deflated portions of these older dunes at Newa, 40 km north-west of Sambhar and on the old terrace of the Saraswati river opposite the village Lesua near Govindgarh. Microlithic and Palaeolithic dune sites at Budha Pushkar, earlier discovered by Drs (Mrs) B. Allchin, K. T. M. Hegde and A. Goudie and the microlithic dune site of Benara 30 km east of Jaipur, discovered earlier by Shri R. C. Agrawal of the Department of Archaeology and Museums, Government of Rajasthan, were revisited. Even after a careful search in the cliff sections exposed by modern ephemeral streams, not a single stone tool was found in the main mass of these older dunes.

Younger dunes are moderately consolidated, yellowish brown in colour and weakly weathered. These dunes are reactiviated wherever human interference with natural vegetation has taken place. The study of shore line features on the southern periphery of Sambhar lake suggests that the lake was higher by a few metres during the mid-Holocene and early historical times.

Preliminary observations indicate that the semi-arid zone, bordering Rajasthan desert experienced extremely dry climate in the closing phase of the Pleistocene and prior to the arrival of Mesolithic man in that region.

67. EXPLORATION IN DISTRICT JODHPUR.—Dr V. N. Mishra and Shri S. C. Nanda of the Poona University, Professor D. P. Agrawal of the Physical Research Laboratory, Ahmadabad and Dr R. P. Dhir of the Central Arid Zone Research Institute, Jodhpur, earned out archaeological and geomorphological investigations. The area traversed by the team were: Jodhpur-Narwa-Teori-Gheora-Ghirai-Chamu-Ketu-Jodhpur; Jodhpur-Osian-Samrau-Lohavat-Sordia-Phalodi; Phalodi-Khirwa-Malhar Rann-Bap-Phalodi; Phalodi-Kolu-Tibna-Jodhpur; and Jodhpur-Bujawar-Mogra Kalan-Luni-Jodhpur.

The area of the first traverse—towards north of Jodhpur--is characterized by thick *kankar* deposits, from 1 to 4 m in thickness. These underlie fluvial silts of aeolian formations. A detailed sedimentological and chemical analysis of these formations will be of considerable help in establishing the Quaternary environmental history of the region. A moderately rich micro-lithic site was located over the high dune on the eastern side of the road near the village of Chamu.

At Khirwa, 10 km north of Phalodi, Middle Palaeolithic tools were collected from the boulder-strewn field of the Bap boulder bed. A rich microlithic site was found on the surface of the limestone outcrop on the left bank of a stream near the village of Lordia, 8 km south-southeast of Phalodi.

In the Malhar Rann, near Bap, a number of sections in the wells dug for salt extraction were examined. These wells show 3 to 5 m thick deposit of alternating sands and clays, clearly showing periodic flooding and drying up of the lake. Samples of these sediments are being analyzed for pollen remains by Shri M. D. Kajale of the Deccan College Post-graduate and Research Institute, Pune.

Microliths were collected from flat ground near the bypass, 2.5 km south of Phalodi.

Thick calcareous deposits were also noticed below aeolian formations at Tibna village midway between Phalodi and Jodhpur, and in the Nadi sections at Mogra Kalan between Luni and Jodhpur.

At Bujawar, 12 km west-southwest of Jodhpur, there is a vast field of intensely dissected and vegetation-covered dunes on the windward side of the sandstone hill. The surface of the dunes is stable with a thin carbonate crust of 1 to 2 cm. The individual dunes have dense concentrations of microlithic industries, suggesting camp sites of considerable duration. No microliths were found in the exposed gully-sections of the dunes, thereby confirming the earlier observation in Districts Ajmer and Jaipur.

TAMIL NADU

68. EXCAVATION AT T. KALLUPATTI, DISTRICT MADURAI.—The Southern Circle of the Survey, under the direction of Shri L. K. Srinivasan, assisted by Sarvashri T. S. Iyengar and P. Narayan Babu, undertook a small-scale excavation at the megalithic habitation-cum-burial site (pl. XXXV A), situated on the foot of Devankuruchi hill near T. Kallupatti in Tiruman-galam Taluk, with a view to ascertaining the cultural context of the white-painted black-and-red ware, collected in surface exploration. Excavation was conducted in the habitational area (TKP-1) on the northern slope of the hill and the burial area (TKP-2) on the southern slope.

Excavation in TKP-1 revealed that the site was mainly occupied by the megalithic people. However, the occurrence of a few chert blades, perforated sherds, burnished grey ware and a few black-on-red ware sherds showing slipped exterior and interior surfaces in the lower levels indicates the lingering on of the chalcolithic elements into the megalithic period. The site continued to be occupied in the early historical period, as attested to by the presence of some copper coins and the Russet-coated White-painted Ware.

The ceramic industry of the megalithic culture is represented by the Black-and-red Ware, white-painted black (pl. XXXVI A), white-painted black-and-red (pl. XXXVI B), the Russet

coated White-painted, coarse red, black-on-red and burnished grey wares. Black-and-red and white-painted black-and-red wares are represented by deep bowls with or without featureless rims and other commonly known megalithic types. Painted designs include: simple vertical lines, oblique and curved lines, series of concentric angles arranged in opposing order, comb-pattern and floral motifs. The sherds of the Russet-coated White-painted Ware are of indeterminate shapes. Coarse red ware is represented by fragments of perforated vessels, whereas, the black-on-red ware sherds are of indeterminate shape. The burnished grey ware is represented by a fragment of a deep bowl.

Floors made of rammed earth at different levels, stray post-holes, suggesting thatched root supported by wooden posts, were encountered in the excavation.

Other antiquities recovered from the excavation include: terracotta objects like beads, hopscotch, marbles, miniature figurine of a dog; beads of different shapes and sizes including micro-beads made of semi-precious stones like carnelian, agate, jasper, rock-crystal, steatite, coral and gold; stone objects such as perforated weights and sling balls; shell bangles; and metal objects including three copper coins from the top layers.

Excavation in TKP-2 revealed that the burial urn (pl. XXXV B) was deposited in a pit cut into the bed-rock. Iron implements like wedge, dagger, etc., were kept in the pit but outside the urn. The contents of the urn include ash, human bones, smaller pots such as vases, bowls and dishes of Black-and-red Ware. A ring-stand in black ware was also recovered from the area.

69. EXCAVATION AT APPUKALLU, DISTRICT NORTH ARCOT—The Department of Ancient History and Archaeology, University of Madras, under the direction of Professor K. V. Raman, assisted by Drs C. Krishnamurthy, A. Swamy, S. Gurumurthy, Shri P. Shanmugam, the students and the technical staff, conducted excavation at the site on the south-western end of the Genganellur hills near the village Appukallu m Vellore Taluk

Excavation in APKL-1, at the foothill on the topmost terrace of the ashy mound, locally known as Nainarkollai, yielded a 4'40-m thick deposit, Though the upper levels are disturbed, the deposit could be divisible into three cultural periods, viz Megalithic (Period I), early historical (Period II) and mixture of early and late medieval cultures (Period III). However, lower levels are conspicuous by the occurrence of very fine variety of black ware with lustrous polish and Black-and-red Ware along with a large quantity of iron slags. But the lowermost layer yielded a few ground stones of indeterminate shapes devoid of pottery. It could not be ascertained whether this level suggests the survival of the pre-megalithic times.

Three floor levels, two of which belonging to late medieval and one to the early historical, were also encountered. A cluster of about twenty-three vessels of coarse red ware were found on One of the floors of the late medieval period.

Excavation in APKL-2, on the next lower terrace and about 6 m north-west of APKL-1, revealed deposit of l.9O m thick, representing two cultural periods, II and III. Four floor levels were encountered, of which uppermost and the lowermost are made of rammed *muram* of dark brown colour, the remaining two are of rammed white *kankary* clay. One elongated pointed butt-end type of neolithic celt and another fragment of a celt were encountered on the floor, second from the top and at a depth of l.20 m, besides slipped red and coarse red wares and other minor antiquities characteristic of the two cultural periods.

Excavation in APKL-3, on the south-western slope of the Genganellur hill, exposed debris belonging to Period I. The megalithic people lived in houses on the slopes of the hill in flat areas bound by stone boulders. On the bed-rock of the hill-slope was encountered a circular floor enclosed by boulders. Fine black ware and Black-and-red Ware were encountered from top to the bottom levels.

Excavation in APKL-4, on the top of the hill, showed that this area was very sparsely occupied, sometimes during Periods II and III, as evidenced by the occurrence of a few sherds of the red-slipped ware and two of the Rouletted Ware,

Excavation in APKL-5, on the fringes of the mound, indicated a limited occupation during the late period.

Two hero-stones, one of them belonging to *circa* eighth century A.D., and a ruined medieval temple with *Saptamatrika* sculptures, were noticed near this habitation site.

UTTAR PRADESH

70. EXPLORATION IN DISTRICT AGRA.—Shri C. B. Trivedi of the Northern Circle of the Survey, during the course of his exploration discovered three rock-shelters at Bandrauli and two at Madanpura (pl. XXXVII A), both located 4 km south-west of Fatehpur Sikri. Paintings belonging to many periods were noticed in these shelters. The earliest paintings (pl. XXXVIII), executed in dark chocolate pigment, consist of linear human figures and elongated bull-like animals, reminiscent of those on the chalcolithic pottery of Navdatoli. The later paintings (pl. XXXVII B) include hunting scenes, with boar, stags, bull, horse-riders, sword and shield bearing human figures and *Ramayana* themes. An inscription, written in Brahmi script of Kushana characters, was also noticed in one of the shelters. A stray microlithic flake was collected from one of the shelters.

Shri J. P. Srivastava of the Northern Circle of the Survey, assisted by Dr G. A. Qamar, Sarvashri L. M. Wahal, R. S. Sirohi, D. B. Jain, C. B. Misra and B. B. Sur, discovered twelve rock-shelters in the hillock of Rasulpur, situated 4 km north-west of Fatehpur Sikri. Some of the shelters were found to bear paintings. The site also yielded microlithic tools. Assisted by Sarvashri L. M. Wahal, R. S. Sirohi and S. P. Saxena, he also discovered a small rock-shelter in the village Chudiali towards north-east of Fatehpur Sikri. An inscribed sarcophagus dated to *circa* 900 A.H. (A.D. 1494) was also located there along with two *baradaris* of medieval period, probably belonging to the Sultanate period.

71. EXCAVATION AT FATEHPUR SIKRI, DISTRICT AGRA.—The Northern Circle of the Survey, under the direction of Dr S. C. Ray, Sarvashri C. B. Trivedi and J. P. Srivastava, assisted by Dr G. A. Qamar, Sarvashri L. M. Wahal, C. B. Misra, S. K.Jain, R. S. Sirohi, C.P. Satsangi, B. B. Sur and Y. K. Sharma, carried out excavation under the national project. This season's work involved: (i) trial digging on the slopes to the east of Badshahi gate (FPS-I); and (ii) clearance of debris in the area lying south-west of Tansen's *baradari* (FPS-II).

The excavation in FPS-I revealed structural remains limited to plinths, floorings and bases of pillars and pilasters, of a small house with a rectangular room (pl. XXXIX A) flanked by square side-chambers on either side, being interconnected through a doorway. A small cell lying at the south-eastern end of the side-chambers yielded Chinese porcelain and glass pieces. Bas-relief on the bases of pillars and pilasters of the chambers suggests that the entire structure may have been originally decorated with carvings in low relief. Along the back wall of this house runs a passage of 1.0 m width. Traces of door sockets were found at the eastern end of the passage.

In front of the Badshahi gate, on the slope behind the Record Room *(Dqfter Khana),* and to the north of the road from Agra Gate to the Buland Darwaza, a complete *hammam*-complex, consisting of five rooms, has been exposed (pl. XL). Three chambers of the structure are well preserved with their floors, plastered walls and low domical vaults. Traces of fresco paintings and beautiful plaster-cut work were found on the walls and the soffit of the ceiling of the rooms. This house, therefore, might have belonged to a man of high rank. One of these rooms, where the inlet drains and clay conduit pipes passing through the walls and ceilings

were traced, appears to be a hypocaust chamber. Attached to its southern wall, which exhibits the intricate system of boiling the water in the hypocaust chamber, 50 cm below the floor-level of this room at the south-eastern end, eight pillar bases of *lakhauri* bricks have been exposed. Attached to this room were exposed other chambers where only the walls are extant to a height of 2.0 m and the floorings partly preserved. Over the roof of this *hammam* were found two overhead tanks (pl. XXXIX B). One of these, on the eastern side, is 2.0 m deep and is in a fair state of preservation. The side walls show the traces of plaster and the floor of the tank is paved with square red stone slabs having neat joints. In between these two tanks, on the northern side, a structure of two rooms with walls extant to a height of 7.50 m was discovered. Pillar and pilaster bases, arranged in double rows, were found inside the structure. A flight of three steps descends to the tank in one of the rooms. Stairs have also been provided to descend into the tank from another room exposed on the northern side. Main access to the *hammam-complex* is from the western side through an archway. A wall running north-west to south-east for 45*0 m, to the west of the complex at a distance of 15.0 m, was encountered. Along this wall on its eastern side were found five rooms in a row. Traces of plaster over the walls and on the floor in the northern-most room were noticed. Two hearths were encountered in another room which was probably a kitchen. The southernmost room, which is connected with two underground channels of dressed red sandstone, is of small dimension, and probably used as lavatory. The northern wall of this room was found running straight towards north-west where it probably met with the wall coming from a room excavated at the south-eastern end of the *hammam*-complex. Thus a spacious courtyard was formed having a wall at its northern side. Two rooms on the northern side of the courtyard were exposed. To the north-west of this courtyard was a channel with an opening of 2 X 2 m which is found to run beneath the flooring of the western room of the *hammam.* Outside this room was found a soak-pit at its mouth. A small enclosure over this channel, however, appears to be a later addition.

Work in FPS-II revealed several structural remains including cells, side rooms and a courtyard. They were built of dressed blocks of stone. In some of the cells, traces of plaster were noticed on the walls and floors. The area showed traces of occupation during the medieval period.

Noteworthy among the finds recovered are sherds of glazed ware, plaster-lumps with beautiful decorations and a Mughal copper coin of A.H. 1022 (A.D. 1612-13).

72. EXCAVATION AT RAMBAGH, DISTRICT AGRA.—The Northern Circle of the Survey, under the direction of Dr S. C. Ray, Sarvashri C. B. Trivedi and J. P. Srivastava, assisted by Sarvashri L. M. Wahal, C. B. Misra, C. P. Singh, S. K. Jain, G. P. Satsangi, Y. K. Sharma and S. K. Sharma, carried out a small-scale excavation with a view to exposing the old drainage system for playing the fountains on the original lines.

The excavation revealed an underground earthen pipeline, laid north-south on a platform and connected with cascades on either side (pl. XLI). A wall running parallel to the pipeline, but at a lower level, and to the west of the platform at a gap of 30 cm was unearthed. Another parallel wall to the east of the platform was encountered. Excavation in the trench, taken for determining the structural sequence, had to be abandoned, as no traces of regular layers could be encountered even after excavating to a depth of 4 m.

During the course of surface exploration in and around the Rambagh area, a red sandstone *amalaka* of a temple of early medieval period was discovered.

73. EXCAVATION AT BIRDPUR, DISTRICT BASTI.—The Excavations Branch I of the Survey under the direction of Shri K. M. Srivastava conducted a small-scale excavation at Birdpur, 9 km south of Piprahwa, which corroborates in distance and direction the recording of the Chinese pilgrim Hiuen Tsang regarding the location of Sarakupa from Kapilavastu. Sarakupa

is the place where the arrow shot by Buddha during athletic exercises in childhood pierced the ground to such a depth that water gushed out. A modern temple with *linga* now stands atop the mound.

Excavation in the trench, laid in the centre of the circular mound, yielded two small squattish copper vessels at a depth of 6 m from the top. One of the vessels was kept below a brick beautifully carved with lotus having eight petals. The vessels and the carved brick were recovered from sand. A brick platform, just above the findspot of the vessels, was encountered at a depth of 570 m. There were regular courses of bricks up to a depth of 3·70 m after which brick courses alternated with sand for 2.0 m.

There were at least two structural phases, the earlier being represented by probably a *stupa,* over which a square temple with moulded and decorated bricks was constructed. The earlier phase which yielded copper vessels could be dated roughly to the Kushana period and the Gupta times. No datable antiquity was recovered from the excavation.

74. EXCAVATION AT PIPRAHWA AND GANWARIA, DISTRICT BASTI.—The Excavations Branch I of the Survey, under the direction of Shri K. M. Srivastava, resumed excavation at the site of Ganwaria, adjacent to Piprahwa, with a view: (i) to ascertaining the extension and plans of the mud-houses partially exposed in the last season's *(1975-76,* pp. 47-50) dig; (ii) to establishing the stratigraphical relationship between larger and smaller structural complexes; (iii) to exposing the smaller structural complex completely; and (iv) to confirming the existence of house-complexes below the shrines of Period III.

Excavation in the area towards west of the larger structural complex, intended to expose houses with mud-walls, revealed that the earliest occupation at the site was subjected to regular inundation, as evidenced by the deposit of parallel layers of sand and silt. In one of the trenches, remains of a mud-wall could be traced only to a limited extent, the rest of it having been washed away. In the second trench, a unique mud-wall structure (pl. XLII A), circular on plan, was exposed. Traces of post-holes were encountered.

Excavation in the trenches laid to establish the stratigraphical relationship between the larger and smaller structural complexes revealed that the earliest occupation represented by mud-houses was confined to the western part of the mound and did not extend to this area. Further, the evidence showed that ground level had been raised by piling up hard yellow compact clay, as a safeguard against the recurring calamity of inundation of the habitation. This piled up earth was deceptive and was taken to be the natural soil while exposing the rooms of the larger structural complex. But the occurrence of a number of pits within this deposit suggested earlier occupation. During this year's work, too, series of huge pits were observed, disturbing the earliest levels. Being sandwiched between the larger and smaller complexes, the structural activity in this area was not brisk and did not continue in all the five phases. It was restricted to the first two phases only. The only important structure in this area was a small house for the common man. The house had only three rooms in the first phase. Subsequently, in the second phase, the number of rooms was increased to four (pl. XLIII A). A miniature well and a small circular platform-like structure, belonging to the second phase, were also encountered.

In the central courtyard of the larger structural complex, three rooms with verandahs on northern and western sides, belonging to first and second phases, were exposed. A spacious verandah (2.80 m) between the central courtyard and the rooms all around was provided with 1-0 m wide baked brick wall. In the south-western corner, a small triangular platform with baked bricks-on-edge was found attached to the verandah inside the courtyard. The covered baked brick drain (pl . XLIV), partly exposed earlier, was found originating from this platform. It was observed that the general plan of the larger complex did not undergo any major change in all the five phases.

Excavation in the smaller structural complex confirmed several alterations in the plan of the structure in successive phases. In fact, the changes were so frequent that there was hardly any similarity in the layout of different phases. As in the case of larger complex, five structural phases were established in the smaller one too, but unlike the former the central courtyard was beautifully paved with bricks in the last two phases. The brick-paved courtyard (10 m sq) was separated from the rooms with verandah (2.15 m wide) all around by 85 cm wide wall. On the north-eastern corner of the courtyard was found a well (pl. XLIII B). A deep covered baked brick drain in the smaller complex, as in the case of the one in the larger complex, originated from the south-western corner of the courtyard with its outlet in the same direction.

The structures on the northern and eastern sides close to the smaller complex were restricted to first three phases only. They were not so well planned and elaborate. The walls of the structures on the northern side were badly eroded. However, with the traces of the walls and brick-paved flooring, plan of three rooms could be reconstructed. The size of the rooms was bigger, and extended below the smaller complex. A rectangular cistern (2.35 m deep) on the south-western end of the house was remarkable for its construction (pl. XLV A). On the north-western end of the house was exposed a beautiful deep well (1.05 m diameter) with sixty-three courses (pl. XLII B), the last course still remaining unexposed due to subsoil water level. The wall is provided with brick-paved platform all around it.

On the north-eastern corner of the smaller structural complex were exposed two houses of which a room and a verandah each, belonged to the first two phases.

Walls of the earlier phases below Shrines 2 and 3, noticed earlier, were supposed to be residential structures. In order to verify the observation of the Chinese pilgrim Hiuen Tsang that civic structures were converted into religious structures, a small area on the north-western corner of Shrine 2 was undertaken for digging by removing an insignificant portion of the shrine. As expected, rooms of a house-complex, meant for common man, were encountered. The structural activity in this area also started in the first phase. A room of the first phase came to view in the limited area, though it had its extension towards south. The house was made much more elaborate in the second and third phases. Of the second phase another room towards the northern side was also exposed. In the third phase addition of yet another room was noticed on the eastern side (pl. XLV B). The addition of the last room was apparent from the abrupt end of the walls of the first two phases. The cross-wall of the room of the third phase had been eroded leaving behind only traces.

On a reassessment of the entire material and structural activity at the site, a division of Period III, which covered a long range from Sunga times to the fourth century A.D., into two was considered essential. This year Period III has been dated between second century B.C. to the beginning of the Christian era, and Period IV from the beginning of the Christian era to fourth century A.D. The earlier dating of the Periods I and II, however, was confirmed this year.

Ceramic industry of Period I is represented by grey, black polished and red wares. Dishes with red incurved rim and flat grey bottom, typical of the Painted Grey Ware levels in western parts of northern India, were found in this year's work. Painting in black over a greyish surface was a new feature noticed this year. Painted fragments carried thumb impressions in the same pigment on the interior. A variety of shades appeared in the Northern Black Polished Ware, in addition to painted ones in Period II.

Noteworthy among the other finds are: a terracotta sealing which may throw new light on the Kushanas mentioning the names of two kings and having Siva flanked by *trisula* and battle-axe, legend in Brahmi characters of first-second century A.D., read tentatively as *Kqfu-puta Vimasa;* few other sealings from Period IV, of which one appears to be a monogram; two hoards of coins, each found in a small pot in the area between the larger and smaller complexes, one of them having sixty-four silver punch-marked coins (pl. XLVI A), and the other thirty-

seven copper coins probably of Kushana period (pl. XLVI B); bone points of various shapes, majority of them belonging to Period II; terracotta figurines of demons (pi. XLVIII), one of them a female having a frightening expression with projected nipples, holding a bowl in her stretched left hand and her hair stylistically dressed with knots at the back (pl. XLVI I A), and the other figurine depicted as devouring an entire animal in his mouth; a mother and child and a female bust with the left arm raised and holding a mirror in her right hand, artistically presented with the help of lines and strokes in low relief, other few female figurines having elaborate hair-dress (pl. XLVII B); a child suckling the breast; a male bust with a typical snake-hood-like head-dress on the top of the head and fan-type round the ears; various varieties of silver and copper coins; silver ear-stud; copper bowl, wire, nails, rings, bell, antimony rods; glass bangles; beads of terracotta, glass, ivory and semi-precious stones; soapstone vessels; weights and pendants in semi-precious stones; terracotta stamps, skin-rubbers, whistles, dabbers, bangles, wheels, gamesmen, decorated pestles; iron nails, razor, knife, sickle, arrow-and spearheads; stone quern; and decorated terracotta ornaments (pl. XLVI C) in the form of *sarpa-kundalas* and snake-headed pendants. Imitation of a conch-shell in terracotta (pl. XLVI D) is another interesting find.

A small-scale excavation on the northern side of the *stupa* at Piprahwa was undertaken to verify the three phases established earlier. While the three phases were distinguished strati-graphically, the *pradakshina-patha* of the earliest phase was exposed 90 cm below the one of the second phase. With brick-edged outline, the *pradakshina-patha* was paved with brick-bats.

75. EXCAVATION AT AYODHYA, DISTRICT FAIZABAD.—In continuation of last year's work which was taken up under the project called 'Archaeology of the Ramayana Sites', excavation was resumed under Professor B. B. Lai of the Indian Institute of Advanced Study, Simla and Shri K. V. Soundara Rajan of the Survey, assisted by Sarvashri B. Narasimhaiah, Rambabu, M. S. Mani, R. K. Sehgal, J. C. De and A. K. Mishra of the Survey and Surya Kant Srivastava and R. N. Kaw of the Institute. The work was concentrated on two important sectors in the ancient part of the city, namely Ram Janma Bhumi mound and the open area to the west of Hanuman Garhi, besides a few trenches at Sita-ki-Rasoi.

The excavation revealed a fairly compact and working sequence for the antiquity of the place from its first settlement over the natural soil. This began with the use of the well-known Northern Black Polished Ware, in all its shades. At the lowest levels, alongside the Northern Black Polished Ware, were also found a few sherds of grey ware, painted with fugitive bands in black pigment along the rim or obliquely on the exterior. This is taken, on a consideration of the position of this ware at Sravasti, Piprahwa, Kausambi, etc., as the very late and degenerate phase of the well-known Painted Grey Ware found at Hastinapura, Mathura, Ahichchhatra, etc. On the basis of the date available from other sites like Mathura, Sravasti, Kausambi, etc., it would seem reasonable to ascribe the first occupation of the Janma Bhumi area to *circa* seventh century B.C.

With this inception, the occupational phases of the mound appears to have continued up to *circa* third century A.D., represented by several structural phases. In the earlier stages, the houses were of wattle-and-daub or mud, followed by those of baked bricks. In the Janma Bhumi area, a massive wall of bricks was observed across the sector obliquely, which may perhaps be identified as a fortification-wall (pl. XLIX). Immediately below this massive wall were found mud-brick structures. In the upper levels of this phase, which may perhaps be called the post-rampart phase, extending from *circa* third century B.C. to the first century A.D., terracotta ring-wells were noted. The fortification-wall appears to have had a fairly deep ditch, almost like a moat, just on its exterior, which was partly cut into the natural clay overlying the fluviatile sand bed. The other site, near Hanuman Garhi, yielded a good number of structures of the Northern Black Polished Ware and later periods, ring-wells of more than one type, including

the typical wells using wedge-shaped bricks (pl. L A), well-known during the later part of the Northern Black Polished Ware period.

The excavation yielded a rich crop of antiquities, among which about half a dozen seals, about seventy coins and over a hundred terracotta figurines deserve special mention. The most noteworthy among them are a terracotta sealing (pl. L B) of king Vasudeva (noted already by his coin-issues of Ayodhya) of the second century B.C., a coin of Muladeva of the same period and a grey terracotta figurine of a person (Jaina Kevalin?) with bald head, distended ear-lobes and in *kqyotsarga* pose (pl. L G). The last-mentioned object came from levels ascribable to *circa* fourth century B.C. and is perhaps the earliest Jaina figure of this kind so far found in India. The other terracotta cult figurines of occasionally massive proportions, found particularly profusely from Hanuman Garhi site of *circa* first-second century A.D., are comparable to the so-called exotic types noticed by Shri V. S. Agrawala from Ahichchhatra excavation and also met with in good number from other sites like Kausambi, Piprahwa, Vaishali, etc.

One of the most significant discoveries, pertaining to the early historic stage, was the occurrence of sherds of the Rouletted Ware (pl. L D) in levels assignable to the first-second century A.D. This phenomenon may well be regarded as signifying large-scale trade and commerce at Ayodhya in the early centuries of the Christian era. This trade must have been along the arterial riverine routes of the Sarayu (on the banks of which Ayodhya is located) and through it of the Ganga, after their confluence at Chapra, linking sites in eastern India like Tamralipti (Tamluk). The Sarayu and the Ganga have been, till recent times, carrying on a large volume of water-borne trade with eastern India using *bajaras* (large boats). This is perhaps the most inland context in which the Rouletted Ware has occurred in northern India. In peninsular India, it is occurring sometimes in hinterland also, as at Brahmagiri, Sengamedu, etc.

It is rather remarkable that the Gupta period is not significantly indicated at this site—a fact also noticed in the first season's dig in 1975.

After the early historic deposits, there is a break in occupation, with considerable debris and pit formations before the site was again occupied around the eleventh century A.D. Several later medieval brick-and-kankar lime-floors have been met with, but the entire late period was devoid of any special interest.

Excavations were also undertaken at and around Nandigram, about 16 km south of Ayodhya on the bank of the Tamsa, which, according to Valmiki *Ramayana,* was the seat of government of Bharata, ruling by proxy during Rama's exile The result of the limited digging revealed a coeval antiquity, by and large, with Ayodhya. The site yielding such an evidence was especially the mound at Rahet, on the south bank of the Tamsa, while the present day Nandigram is located on the northern bank. . .

The antiquity of Ayodhya, thus, on the basis of these excavations, is ascribable to the early seventh century B.C.

76. EXPLORATION IN DISTRICT KANPUR.-In the course of his exploration Shri LM. Wahal of the Northern Circle of the Survey, discovered ancient sites yielding Painted Grey Ware at Ujhan and Northern Black Polished Ware at Chandanpur, Mau Radhan Rasdhan Rohini, Sankhim Buzurg and Ujhan. The site at Rohini also yielded a few sherds of the painted Northern Black Polished Ware An important discovery from Ujhan is a circular terracotta sealing bearing legend *Vagapalasa* in Brahmi characters of circa third-second century terracotta symbol of two intertwined serpents, forming a circular knot in the centre.

Further he discovered an ancient site at Kheora on the right bank of the river Ganga, yielding Painted Grey, Northern Black Polished, black-and-red and red wares as also the Muslim glazed ware. One rectangular cast copper coin, bearing a *chaitya,* a tree and a cross on the obverse and an elephant on the reverse, was also collected from the site.

77. EXCAVATION AT JAJMAU, DISTRICT KANPUR.—The Department of Archaeology, Government of Uttar Pradesh, under the direction of Shri R. C. Singh, assisted by Shri Hem Raj, resumed excavation with a view to obtaining the cultural sequence of the site. The excavation revealed three cultural periods.

Period I is represented by the occurrence of the Northern Black Polished Ware and structures of baked and sun-dried bricks (48 X 28 X 7 cm) representing four phases. Among the finds of the Period, mention may be made of terracotta sealings, most of them bearing legends in Brahmi script. A sealing with a letter *ma* in Brahmi script and symbols like *svastika* and *vasti* is interesting. Other finds include: terracotta human and animal figurines, sling balls, discs and flesh rubbers; vase-shaped terracotta beads; hooks, fragmentary rings, nails, arrow-and spear-heads of iron; styli and awls of bone; beads and pendants of carnelian, glass, crystal and agate; bangles of ivory, bone and terracotta; copper coins; and terracotta gamesmen of various shapes. One terracotta mother goddess and a terracotta votive tank are the noteworthy finds of this Period.

Period II is distinguished by the remains of structures of baked bricks (38 X 24 X 4 or 5 cm), representing three phases. Other important finds of this Period include: terracotta human and animal figurines; lids of caskets of stone; iron arrow-heads; antimony rods and coins in copper; terracotta sealings; and ivory bracelet. Ink-pot-type lids, sprinklers, *makaramukha* spouts and sherds of stamped pottery of red ware were also collected from the deposits of this Period.

Period III is marked by the occurrence of knife-edged bowls, ring-based vessels, lids with hollow conical knob, double spouted vases and a few pieces of glazed ware. One of the sherds of the glazed ware has whitish friable gritty core, while other pieces have terracotta core with painted designs in various colours. The structures of this Period, represented by three phases, were invariably built of reused bricks of large size or *lakhauri* bricks measuring 14 X10 X 3 cm. Other finds of the Period include: nails, arrow-heads, spear-heads and door-rings of iron; fragment of a vase, rings, rod with flattened ends of copper; terracotta human and animal figurines, dabbers, rattle, potter's stamps, toy-carts and wheels, etc.; bangles made of shell, bone, ivory, glass and terracotta; and beads of carnelian, terracotta and glass. A hoard of thirty-six copper coins belonging to Sikandar Lodi was found in the middle phase of the Period.

78. EXCAVATION AT MATHURA, DISTRICT MATHURA.—In continuation of the previous year's work *(1975-76,* pp. 53-56), the Excavations Branch II of the Survey, under the direction of Shri M. C. Joshi, assisted by Sarvashri B. Raja Rao, R. C. Agrawal, B. B. Sharma of the Excavations Branch II and J. N. Gandhi of the Headquarters Office, A. K. Sinha of the Eastern Circle and P. Singh of the Northern Circle of the Survey, conducted excavation with the following main objectives: (i) to examine the nature of deposit and stratigraphical position of the scores of sculptures found during levelling operations at a mound in Govindnagar area, in the western part of Mathura, near Bhuteshwar; (ii) to obtain further details of the already exposed tank-complex at Kankali Tila; and (iii) to further examine the inner fortification and habitation. With these aims in view, excavations were taken up in the compound of Mathura Water Works (MTR-12), the Govindnagar Housing Colony area (MTR-13), at Kankali Tila (MTR-5) and Katra Keshavdeo extension (MTR-9). Besides, some section-scraping was also conducted on the northern part of the inner fortification (MTR-14), at a place spoiled by unauthorized local diggers. The sites excavated confirmed the already known cultural sequence. No remains of Period I were found in any of the sites excavated during this season. The details of other Periods are as follows.

Period II is represented by compact mud platforms and some circular pits containing animal bones, ash and pottery, associated with the Northern Black Polished Ware, including plain grey and red wares. Such pits were also encountered in the previous years at MTR-7. Important antiquities of the Period II include: bone points; terracotta figurines of mother

goddess (pl. LI A), elephant, horse, snake, ram; a copper coin in damaged state; and iron objects (pls. LVI and LVII).

Period III is marked by the remains of floors of mud, *surkhi,* brick-bats and bricks, exposed mainly at MTR-13. Significant structures were a lime plastered brick-floor (pl. LII A) and a complex of twelve mud blocks (platforms) of varying sizes (pl. LIII A) containing in one case two damaged storage jars *in situ.* Other interesting remains were noticed in courtyards, paved with brick-bats and bricks with border of brick-on-edge (pl. LIII B), superimposing floors of compact mud Two longish ovens and a ring-well, associated with the upper levels of this Period, were also unearthed. Most of the floors were disturbed by later pit activity. The use of bricks (40/39 X 24/25 X 5 cm) and brick-bats were confined mostly to structures built in the later half of this Period. A few structures showed more than two phases of construction. Some of the structures, like a large courtyard, the lime plastered floor with storage jars and mud platforms complex, appeared to have been planned as some kind of public or communal buildings. Notable finds of Period III comprise: forepart of a lion figure in stone (pl. LIV A); terracotta plaques, depicting various deities including a *devi,* with a pair offish; beads of semi-precious stones; copper coins; and iron objects (pls. LVI and LVII). The ceramics of the Period represented the last phase of the Northern Black Polished Ware and the greater popularity of the dish in grey ware with a black slip. A noteworthy pottery form was a deep bowl with burnished exterior surface.

Period IV was mainly represented by partly extant *surkhi,* mud and brick floors (pl. LII B) with marks indicating the use of lime (MTR-13) and mud platforms of which two contained ovens (MTR-9). On one of these platforms, a heap of roof tiles (32 X 20 X 2 cm) was also found. The pottery which was largely represented by red wares was; similar m shape and fabric to that already reported in the previous year from levels of Period IV Amongst outstanding antiquities of this Period mention may be made of: a seal and sealing, respectively reading *vasatasya* and *yuvabalas* with a figure of lion; sculptured jambs depicting scenes from the life of Buddha (pl. LIV D); a flaming Buddha image (pl. LV A); a head of royal statue with tiny Buddha figures on the crown (pl. LIB); a human head with moustache and curly hair most probably of Kubera (pl. LI C); forepart of an elephant with an inscription (pl. LIV B) reading *Sugus-pkasyah* (?) and of a lion (pl. LIV C); *salabhanjika* relief (pi. LI D); figure of devotees carrying ^offerings; terracotta animal and human figurines including a glazed *vamanaka,* a human-female) shaped pendant with a charming head-dress (pi LV C); copper coins; and iron objects (pls. LVI and LVII). It is interesting to note that out of many important sculptures unearthed at MTR-13 only flaming Buddha figure was found in stratified deposit. Another significant object found at MTR-13 was a stone inscription of Huvishka of 50+ ? regnal year, recording probably a gift to Dhanyavarma-Vihara.

Further work done at MTR-5 (Kankali Tila) revealed that the circular structure, earlier supposed to be the base of a stupa, appeared to be a well, with considerable depth, contemporaneous with the tank-complex. Besides, it also became clear in this season that the outer wall of the tank, forming ancillary compartments, was older than the tank proper. It seems that the builders of the tank-complex, originally, wanted to construct a larger tank but after they had raised walls on the north, south and west they abandoned the idea and built a central pool with oblong compartments on the sides.

The section-scraping at the inner fortification (MTR-14) confirmed the evidence obtained earlier. The traces of retaining walls at the north-western turning of inner fortificationwall suggested the existence of a semicircular basion.

Period V was characterized by the presence of mud platforms of considerable extent (MTR-13) and smaller ones with traces of structures on the top (MTR-9). Important antiquities of Period V comprise: Buddha heads in typical Mathura art tradition (pl. LV B); fragments of prabhamandalas with flames; and a Vishnu image (pl. LIV E), with the head missing,

(MTR-13). The pottery of the period consisted of bowls, basins, vases and sprinklers, mostly of simple types, besides painted, decorated and moulded pottery.

79. EXPLORATION IN DISTRICT SITAPUR.—Dr V. N. Misra of the Poona University, Dr Malti Nagar of the Deccan College Post-graduate and Research Institute, Pune, and Professor P. K. Tewari of the J. N. College, Lucknow, explored the Copper Hoard site of Nakrahiya, located about 20 km north of Sitapur and 3 km west of Sitapur-Gala road, where four shouldered axes had been accidentally found in 1966 and were deposited in the State Museum, Lucknow.

The investigation revealed that the axes were buried very close to the surface of the flat ground of the cart-track, close to the base of a *neem* tree, at the northern end of the village. There is no mound of any size nearby or in and around the village. Examination of the exposed cliffs of an artificial pond on the other side of the cart-track did not reveal any pottery or antiquity. However, about 2 km north-east of Nakrahiya on the other side of the Sitapur-Gala road, there is a Jarge but low mound near the village of Farrakpur, which is under cultivation. This mound yielded only late historical pottery. Therefore, the observation that the hoard has no association with any other archaeological material is in line with the information collected earlier by Dr Misra from the Copper Hoard sites of Dhaka, Indilapur, Madnapur and Sarthauli, all in Uttar Pradesh.

WEST BENGAL

80. EXPLORATION IN DISTRICT BANKURA.—Dr S. C. Mukherji of the Department of Archaeology, Government of West Bengal, during the course of his exploration, discovered a protohistoric site at Dihar on the river Dwarakeswar, yielding bowls, dishes and vases of black-and-red and black burnished wares, similar to the material from the chalcolithic levels at Baneswar Danga and Pandu Rajar Dhibi.

A unique terracotta torso of a male drummer probably of pre-Mauryan tradition, was collected from the habitation site at Farakka.

II. EPIGRAPHY

SANSKRITIC AND DRAVIDIC INSCRIPTIONS[1]

ANDHRA PRADESH

1. IKSHVAKU INSCRIPTION, ALLURU, DISTRICT KRISHNA.—This inscription in Prakrit language and Brahmi characters of about the third century A.D. is engraved on three faces of the octagonal shaft of a pillar, now preserved *in situ.* Dated in the eighth regnal year of Ehavala Chamtamula, it records the erection of this stone pillar *(sela-khamba)* by Venhusin, a resident of Halur, for the accumulation of the merit to his wife Chamda and to others, includ ing Jakhasiri and Nagasiri. The record also mentions the *acharyas* residing at Sikharaga, the *talaparimajakas* and *Arya-samgha.*

2. INSCRIPTION, VIJAYAWADA, DISTRICT KRISHNA.—This Telugu inscription engraved on a stone kept in the Victoria Jubilee Museum is dated in Saka 1204 (A.D. 1282) and records a gift of fifty sheep for a lamp to god Anamtasenadeva by Maraboghi Meniki-reddi, for the merit of his parents Malneni and Mallesani.

3. BADAMI CHALUKYA INSCRIPTION, KURNURU, DISTRICT KURNOOL.—This inscription in Kannada language and Telugu-Kannada characters of about the eighth century A.D. records the death of Dantiyamma when he was attacked by the Rattas at Alvandatti during the rule of Prithuvi-Vanaraja Dhurtta in the reign of Kaltivarmma (i.e. Kirtivarma).

4. BANA INSCRIPTION, MACHAPURAM, DISTRICT KURNOOL.—This inscription in Kannada language and Telugu-Kannada characters of about the seventh century A.D. records that during the rule of the Bana king Uttamaditya, Ugraviran fought on horse-back and routed the Chola at Rivandunakkotti (?) and died. Kanda-Banida-arasan Ilankutti is also mentioned. The inscription begins with an epithet *Taruna-vasantan,* probably a title of Uttamaditya.

5. BADAMI CHALUKYA INSCRIPTION, ALAMPUR, DISTRICT MAHBUBNAGAR.—This inscription in Sanskrit language and Telugu-Kannada characters of the seventh century A.D., engraved on a pillar in the *mandapa* in front of the central shrine in the Arka-Brahmesvara temple, records the installation of a *linga* in the temple of Mahadeva by the queen *(mahadevi)* of *Anivarita* Vikramaditya (i.e. Vikramaditya I) and records the grant of fifty *nivarttanas* of land in Vadlamani village to the *mahabrahmana* Pishtisarmman belonging to the Bharadvaja-gotra.

6. INSCRIPTION, ALAMPUR, DISTRICT MAHBUBNAGAR.—This Kannada inscription in characters of about the twelfth century A.D. on the pedestal of Agastya (?) image refers to Nagadeva, the *padihara (pratihara)* of *mahamandalesvara* Hallarasa of Humdur.

[1]Information from: 12-14, 26, the Superintending Archaeologist of the Western Circle of the Survey; 15, 19, 20, the Director, Department of Archaeology and Museums, Government of Karnataka; 21, the Superintending Archaeologist of the Central Circle of the Survey; 29, the Superintending Archaeologist of the Southern Circle of the Survey; 38-40, 45, 46, Shri Krishna Kumar, Registering Officer, Varanasi; 47, the Director of Archaeology, Government of West Bengal; and the rest from the Chief Epigraphist of the Survey.

7. KAKATIYA INSCRIPTION, ALAMPUR, DISTRICT MAHBUBNAGAR.—This fragmentary Telugu inscription on a slab dug up in front of the *gopura* of the Balabrahmesvara temple, in characters of about the thirteenth century A.D., refers to the rule of Prataparudradeva from Orugallu and his *mahasamanta* Bolaya-reddi of Varageluru belonging to the Cheraku family.

8. INSCRIPTION, CHANDAVARAM, DISTRICT PRAKASAM.—This inscription in Prakrit language and Brahmi characters of about the second century A.D., engraved on an ayaka-pillar (?), found in the monastery-area to the north of *mahastupa* records that it is the gift of Hagha, son of Chadamagha to Bhagavat (i.e. Buddha).

9. INSCRIPTION, TIMMAPURAM, DISTRICT PRAKASAM.—This Telugu inscription, in characters of about the tenth century A.D., states that Chagaja-guna-pennadiyutudu and his chief *gamunda (tala-kamunda)* Deseraja killed Mallaparamadiraja of the Taila family and died.

10. INSCRIPTION, ATTILI, DISTRICT WEST GODAVARI.—This Sanskrit and Telugu inscription from Madanagopalasvami temple, engraved in Telugu characters, is dated in Saka 1127 (A.D. 1205) and records the grant of thirty *khandugas* of land from several villages by Visvanatha for food-offerings to god Kesava-Sambhu, for the merit of the chief Kommaya.

11. TELUGU-CHODA INSCRIPTION, ATTILI, DISTRICT WEST GODAVARI.—This Telugu inscription from the Madanagopalasvami temple, dated in Saka 1157 (A.D. 1235) records the grant of four *khandugas* of land for a lamp to god Kesavesvaramahadeva of Attili on the day of *Uttarayana-samkranti* by Malle-chodamaharaju, Pudolichodu and *Mahamandalesvara* Voruga-raju for the merit of their uncle *Mahamandalesvara* Kesavadevamaharaja of Kolanu.

GOA, DAMAN AND DIU

12. INSCRIPTION, DIU.—This fragmentary and much-weathered inscription in Nagari characters of the thirteenth century A.D. records the characters of a king and gives information about the lands distributed to the Brahmanas.

GUJARAT

13. MUGHAL INSCRIPTION, BHADBHUT, DISTRICT BHARUCH.—This inscription dated in Vikrama 1657 and Saka 1522 (A.D. 1600) in Sanskrit and Nagari characters, records the construction of Bharbhutesvara temple in the reign of Patisah Sri Akbar.

14. INSCRIPTIONS, VALABHIPUR, DISTRICT BHAVNAGAR.—Of the two fragmentary inscriptions in the local Gram Panchayat Office, the one in characters of the seventh century A.D., refers to some expedition of a king. The other one, which is much weathered and dated in Saka 1762 (A.D. 1840), in the local dialect, contains a portion of the text regarding the sale of a land.

KARNATAKA

15. RASHTRAKUTA COPPER-PLATE, BIDAR, DISTRICT BIDAR.—A set of three copper-plates, tied together with a ring and seal having the symbol of Garuda, acquired through the good offices of the Superintendent of Police, Bidar, purports to register a grant during the time of Rashtrakuta king Dhruva. The inscription is in Kannada script and Sanskrit language. From a study of the palaeography, it is found that this inscription is a spurious one. However, it is

important for the study of the Epigraphy, as the inscription appears to have been forged in the tenth or eleventh century A.D.

16. INSCRIPTIONS, ADAKI, DISTRICT GULBARGA.—Two broken pillars, standing in front of the Maruti temple outside the fort, bear six Kannada inscriptions, which, partly damaged, belong to three dynasties, viz. Chalukyas of Kalyana, Kalachuryas and Yadavas. Of the two inscriptions of the Chalukyas of Kalyana, the first one belonging to the reign of Tribhuvanamalla (Vikramaditya VI) eulogizes the Jaina ascetic Mahavira Siddhantadeva and the *mahamandales vara* Echarasa of the Ahihaya family and describes Sireya Kalisetti and his family, while the second one dated in Chalukya Vikrama year 50, Visvavasu (A.D. 1126), records the construc- of a *basadi* and the installation of Parisvadeva at Adaki and refers to Mallisetti, Kalisetti and tion the Jaina ascetic Guna Vira Siddhantadeva.

Three inscriptions of the Kalachurya king Rayamurari Sovideva, two of which refer to his regnal years 5 (A.D. 1171) and 6 and represent him as ruling from the capitals Saleyahalliya-kuppa in the earlier instance and Modegamurakuppa in the later, records series of gifts, both in paddy and money to the *piriya-basadi* of Parsvanatha at Adaki for the purpose of providing for the worship and offerings, *ashthavidharchchana, jivadayashthami* and *samkramana-nandisvara-grahana-samkranti* by *mahamandalesvara* Echarasa of Ahihaya family and other officials along with the famed 500 *svamis* of Ayyavali. The third one eulogizes the king and his subordinate *mahamandalesvara* Ayacharasa of the Ahihaya family.

One inscription of the Yadava king Singhana, dated in his regnal year 4(5), Sobhakriti (A.D. 1243) records the gift of oil for burning a perpetual lamp in the Tenkana-koppuva-jinalaya of god Parsvanatha at Adaki by the *mummuridandas, ubhayananadesis, prabhus* and *muligaru.*

17. TWO LATER CHALUIKYA INSCRIPTIONS, HANDARKI, DISTRICT GULBARGA.--These two Kannada inscriptions, one on a slab fixed into the inner wall of a shrine and the other on a slab fixed into the left side wall in the *prakara* of Lokesvara temple, belong to the reign of Tribhuvanamalla (Vikramaditya VI) ruling from the capital Jayantipura. Both give the genealogies of the king starting with Taila II and of his feudatory *mahamandalesvara* Lokarasa of the Ahihaya family and record that the latter granted the village Gundithuruvalige, situated in Aralu 300 and of the ownership *(prabhutva)* and fief *(manneya)* of Teraduru, to god Lokesvara at Pandirkke on the day of lunar eclipse in the Chalukya Vikrama year 43, Vilambi (A.D. 1118). They also record a grant of 500 *Kalamattaru* of land which was entrusted to the *acharyya* of the Kalamukha *naishthika-matha* towards the expenses of worship and offerings, feeding of ascetics, maintenance of students who read Kannada script and the teachers who teach them, payment for the dancing-girls *(kambada-sule),* etc. Both engraved, in continuation, record more grants to the same god.

18. Two RASHTRAKUTA INSCRIPTIONS, DISTRICT GULBARGA.—Of these two. Kannada inscriptions, the first one, on a broken stone pillar kept in front of Ramalingesvara temple at Mudhol, belongs to the time of Kannaradeva (Krishna III). It records that while Gonayya was administering Muduvalal, his subordinate Guli-gamunda and another person (name lost) installed the god Mahadeva, built a temple and made grant of 3 *mattar* of land, 10 *chammadi* of stone, 10 house sites, a garden and an oil-mill *(deva-gana).* The other one damaged, on a stone block found near a ruined temple in the village Kurukunta, dated Saka 8(55), Jaya (A.D. 933) refers to the reign of Suvarnavarsha (Govinda IV) and mentions the *mahajanas* of Kulukunta, Mudiliya Bharatayya, Apputayya, Sirichandra Navuga and others.

19. HOYSALA COPPER-PLATES, ANEKANNAMBADI, DISTRICT MYSORE.—A set of 5 copper

plates (pl. LVIII A) with a ring and without seal, belongs to the Hoysala king Narasimha III, dated Saka 1141 Bahudanya Samvatsara (A.D. 1219) and records about the grant to *maha-agrahara* Pragurvi, Ballapura for the study of Vedic literature and for the maintenance of Kesava temple. Another set of five plates (pl. LVIII B) with a ring and a seal, belongs to the reign of Hoysala king Somesvara and is dated Saka 1165 (A.D. 1242). It registers the grant of the village Anekannambadi to Kambiah Dhananayaka. The seal has a tiger in relief with sun, moon and a sword.

20. TWO SETS OF COPPER-PLATES, SHIMOGA, DISTRICT SHIMOGA.—Of the two sets of copper plates consisting of five plates in each, set in a ring with a seal depicting boar, acquired through the good offices of the Deputy Commissioner, Shimoga, one appears to belong to the period of early Chalukya Vinayaditya (A.D. 681-694). However, the study of the contents of both the sets shows that they are spurious records, but nevertheless are important to show how later people created false records.

MADHYA PRADESH

21. COPPER-PLATE OF VIJAYSIMHADEO, JHULAPUR, DISTRICT MANDLA.—This copper-plate, belonging to the reign of the Kalachuri king of Tripuri Vijaysimhadeo, in Sanskrit language and in Devanagari script, is dated Samvat 949 (A.D. 1197) and records the gift of a village Matami of Jaulipattala (Jabalpur) region.

22. BRAHMI INSCRIPTION, PANGORARIA, DISTRICT SEHORE.—Engraved on the shaft of a *chhatri* in Prakrit language and Brahmi characters of about the second century B.C., this inscrip tion records that the umbrella *(chhata)* is the gift of *bhikshuni* Sagharakhita and it was caused to be made by Pusa, Dhamarakhita and Araha, the *amtevasinis* of Koramika (pi. LVIII C).

MAHARASHTRA

23. VAKATAKA COPPER-PLATE CHARTERS, MANDHAL, DISTRICT NAGPUR.—Three sets of copper-plates were found in a pot in the course of excavations at Mandhal and now preserved in the Department of Ancient Indian History, Culture and Archaeology, Nagpur University, Nagpur. All of them are in Sanskrit language and engraved in box-headed characters. The first set belongs to the reign of *Parama-mahesvara Maharaja* Pravarasena II. It is issued from his camp at Pravarapura. It records the royal grant of Mmayasa-grama situated on the western bank of the Benna to a Brahmana named *Upadhyaya* Matrisvamin, the son of *Upadhyaya* Aprati-grahaka belonging to Taittiriya-sakha and Kautsa-gotra in the year 16, Karttika. The charter was executed by the king himself and it was written in the year 17, Karttika ba. 10, when Chitravarmman was the *senapati.*

The second set belongs to the reign of *Maharaja* Prithivisena II and is issued from his camp at Ramagiri. It is dated in the year 2, Grishma-paksha 7, 12th day and it records the royal grant of the village Kurubhajjaka situated on the northern bank and bounded on the west by Lavana-tailaka, on the north by Ishtakapalli, on the east by Benna and on the west by Govvasahika to three brahmanas named Mahesvarasvami, Agnisvami and Brahmasvami, the sons of Matrisvami, the son of Dronasvarni belonging to Taittiriya-sakha and Kautsa-sagotra, for the merit of the king's mother Ajjhika-bhattarika. It is stated that the *Senapati* of the time was Vishnudatta. The charter was engraved by Sarvadatta.

The third set also belongs to the reign of the same king and is issued from his camp at Bennatala. It is dated in the year 10, Grishma-paksha 1, 1st day. It records the royal grant of the village Govasahika situated in the Uttarapatta and bounded on the west by Sulkavata, on

the north by Kurubhenjnaka on the east by Benna-nadi and on the south by Piderika, to four Brahmanas named Mahesvarasvamin, Brahmasvamin and Harasvamin all of the Kotasa-gotra and to Varahasvamin, all belonging to Bennatata. The grant was made at the *dharmasthana* for obtaining merit here as well as in the other world. It is stated that at the time the *Senapati* was Vishnudatta. The charter was engraved by Sarvadatta.

PONDICHERRY

24. CHOLA INSCRIPTION, BAHUR, PONDICHERRY.—This Tamil inscription, engraved on the west wall of the Mulesvara temple, is dated in the 18th year (A.D. 1029) in the reign of Rajendra I. It states that the assembly of Vahur *alias* Alagiyasola-chaturvedimangalam met at the Alagiyasolan-ambalam in the village on the night of Friday su. 1, in the month of Dhanus in the 16th year (1 December, A.D. 1027) along with Kappurar Udaiyar Nilan Venkadanar and decided that the Tank Committee may collect a stipulated levy of paddy per season from the tenants belonging to villages outside and that all the tenants of the village, aged between 10 and 80, except the untouchables, shall remove annually earth in the tank from a pit, measuring 2 X 2 X 1 *kol* of four spans.

25. CHOLA INSCRIPTIONS, TRIBHUVANI, PONDICHERRY.—Of the two Tamil inscriptions of Kulottunga I from the Totadrinatha temple, one dated in his 3rd year (A.D. 1072-73) records a royal order to the *sabha* of Tribhuvanamahadevi-chaturvedimangalam through the officer *(adhikarigal)* Uttamasola-valuvarayar and detailed documents *(kadaiyidu)* through Villavarayar and Vayiragarach-cholar reassigning lands meant for specific endowments formerly made to several deities such as Tirukkundankuli-udaiyar, Sripirantaka-makalam-udaiyar, Kolu-marai-Isvaram-udaiyar, Tuvarapati-alvar, Ganapatiyar called Tribhuvana-nayakar, etc. The other inscription, dated in the fifth regnal year (A.D. 1074-75) of Kulottunga I, records an arrange ment *(vyavasthai)* made by the *sabha* of Tribhuvanamahadevi-chaturvedimangalam m Vilupparaiya-nadu, according to which they undertook to collect taxes at the reduced assess ment on the lands at Pumbadi *alias* Alappirandasolanallur and at Puh-atti-kalattur *alias* Rajadhirajanallur, belonging to *Senapatigal* Rajendrasola Mavalivanadirayar on account of their reclassification as the twelfth class. The lands are stated to have been lying fallow for the past fifteen years and the previous classification was sought to be revised.

RAJASTHAN

26. INSCRIPTION, CHITTAURGARH, DISTRICT CHITTAURGARH.-This inscription on the top of a Siva-head, carved on a stone pillar, found from the bed of the river Gambia and now housed in the Office of the Conservation Assistant of the Western Circle of the Survey, is in mixed Sanskrit and Prakrit language and in characters of the eighth century A.D. and contains devotional verses on Siva.

TAMIL NADU

27. VIJAYANAGARA INSCRIPTION, KANCHIPURAM, DISTRICT CHINGLEPUT.- This fragmentary Tamil inscription in characters of the fourteenth century A.D. engraved on the wall of the Krishna-*mandapa* in the Varadarajasvami temple is dated in the reign of Kampana-udaiyar and seems to record the grant of a village as *madappuram* including the income from taxes *tiruppudiyadu* and *eduttalavu* to the Brahmatantra-svatantrajiyar by the king himself.

28. PALLAVA INSCRIPTION, ORATTI, DISTRICT CHINGLEPUT.- This Tamil inscription on a

slab now lying in the Siva temple is dated in the fourteenth year of Dantivarman {*circa* A.D. 810) and records the construction of a sluice by Nakkan residing at Arrur in (Ne)dungal-nadu in Idurkkottam.

29. BILINGUAL RASHTRAKUTA INSCRIPTION, ORATTI, DISTRICT CHINGLEPUT.—-This bilingual inscription engraved on a stone, in Tamil and Kannada characters, was issued in the 26th regnal year of Rashtrakuta king Krishna III.

30. RASHTRAKUTA INSCRIPTIONS, ORATTI, DISTRICT CHINGLEPUT.—Of the three inscrip tions engraved on one slab lying in the Siva temple, one in Tamil dated in the twenty-fourth regnal year (A.D. 962-63) of Kannaradeva, records a grant of land made to the god Madeva of Uratti for worship and food offerings by Kanchayan, the *Kajanadhikari* (the Treasury Officer). The second inscription, in Kannada language and characters of the tenth century A.D., records an offering of head to god Mahesvaradeva by a person who bears some relationship (details not clear) with Kanchayan, the Treasury Officer. The third is a Tamil version of the second.

31. INSCRIPTION, ERODE, DISTRICT COIMBATORE.—This fragmentary inscription originally from Arachchalur in Tamil language and characters of the fourteenth century A.D., records the gift of (Pal)lavarayan and the inscription is written upwards.

32. HERO-STONE INSCRIPTION, PALAMANGALAM, DISTRICT COIMBATORE.—This inscription in Tamil verse engraved in characters of about the twelfth century A.D. records the death of Chokkan belonging to Karadikulam after killing his enemies in the battle at Pugalmangalam. The inscription is called *kar-pori.*

33. ROCK-INSCRIPTION, SUNDAKKAMUTTUR, DISTRICT COIMBATORE.—This Tamil inscription on a rock in Vatteluttu characters of about the ninth century A.D., bears the label Rajakesari highway *(Rajakesaripperuvali)* and also a verse eulogizing the Chola king Kandan.

34. CHOLA INSCRIPTION, VEMBATTI, DISTRICT COIMBATORE.—This Tamil inscription, dated in the fourth regnal year (A.D. 1073-74) of Kulottunga I, records the conversion of the Vikrama-Palavapuram in Saiyamuri-nadalvar-nadu into a Virapattanam bestowed on the Valanjigas by several members of the mercantile organization

35. INSCRIPTION, MANNARKOVIL, DISTRICT TIRUNELVELI.—This fragmentary inscription in Tamil characters of about the thirteenth century A.D., records an endowment of land exempted from several taxes, *kadamai, antarayam,* etc., for feeding ten reciters (of sacred hymns) in the presence of the deity during the festival in the month of Masi by Senbaganambi *alias* Hanumadasan of Vangipuram.

36. INSCRIPTION, SHENBAGARAMANALLUR, DISTRICT TIRUNELVELI.—Dated in Kollam 703 (A.D. 1527) in the reign of Vira Marttandavarman Chiraivay-Muttavar, the epigraph engraved in Tamil characters records the approval of the deity Jagannathaperumal for the order of the king regarding the assignment of shares of food offerings to Ariyan Ulagudaiya-perumal Iramachandradevan in respect of his duties as *sri-bhandarak kanakku* and *Ariyatturam.*

37. PANDYA INSCRIPTION, UDAYANERI, DISTRICT TIRUNELVELI.—This Tamil inscription of Jatavarman Sundarapandya (A.D. 1251) described as Konerinmaikondan refers to the setting up of a bar for serving water, the digging of a well on the road from Manarpadaividu

to Madurai and the gift of lands as *tannirpandalpuram* to the Brahmanas who maintain it from the twenty-eighth regnal year of the king, by Ilaiyalven Kalingarayar of Nettur.

UTTAR PRADESH

38. GUPTA PILGRIM RECORDS, KALINJAR FORT, DISTRICT BANDA.—A short pilgrim record in Gupta characters in two lines in the rock-shelter south of Sri Nilakantha temple, reads as *Sri Pranamagochara Ana{n)dapuri nama gauna guh(a).*

Other three such epigraphs in the rock-shelter situated beside Mrigadhara shrine, read as *Vidisa gahapati pranamata; Vedisa prativasina ne(tra)pala;* and *Sri Vyasa matragunaditya-ppra(nama)ta.*

39. LATE MEDIEVAL INSCRIPTION, KALINJAR FORT, DISTRICT BANDA.—This twenty-four line inscription on a large sandstone slab in the mosque called Pathar Mahala, is a Sanskrit *prasasti* opening with salutation to Sri Lakshmi-Narayana and followed by verses in praise, of Vishnu. It also mentions the names and achievements of the ancestors of *Maharajadhiraja* Sri Pratapa Rudra Deva who at the instance of his mother Triloka Devi, installed an image of Sri Lakshmi-Narayana in a newly-built shrine beside the holy Koti-tirtha tank inside the fort. The concluding paras of the record mention the names of the poet who composed the *prasasti,* the scribe, the blacksmith and the sculptor, who carved the image. This epigraph in Nagan characters is dated in Pushya *nakshatra* on the fifth day of the dark fortnight of Agrahana, Samvat 1543 (A.D. 1486). The extreme left portion of the inscription is still concealed beneath the floor.

40 POST-GUPTA INSCRIPTION, KALINJAR FORT, DISTRICT BANDA.—This short inscription on the rock-bed in a cave, locally known as Bhagwana Sej, in post-Gupta characters, reads: *Om samadhigata pancha mahasabda mahasamanta sri Vasantaka.*

41 PILLAR-INSCRIPTION OF KANISHKA, MATHURA, DISTRICT MATHURA.— This inscription, originally discovered at Govindnagar in Mathura and now kept in the State Archaeological Museum at Mathura, engraved on a broken pillar in mixed dialect and Brahmi script, belongs to the reign of *Maharaja Devaputra* Kanishka and is dated in the year 12, Hemanta... .Other details are lost.

42. INSCRIPTION OF HUVISHKA, KANKALI TILA, MATHURA, DISTRICT MATHURA -This epigraph is engraved on a stone slab found in the course of excavation at Kankali Tila. The surface of the stone has peeled off at several places with the result the inscription is very much damaged. Engraved in Brahmi script and mixed dialect, this inscription belongs to the reign of *Maharaja Devaputra* Huvishka and is dated m the year 50, evidently of the Saka era, 4th *paksha* name of which is lost, 5th day. It probably records some gift by a person (name lost), the son of *Sarthavaha* Inra(dra)bala and the brother of Bhavadatta to Dhanyavarma-*vihara* for the merit of his parents and all beings.

43 INSCRIPTION ON BUDDHA-IMAGE, MATHURA, DISTRICT MATHURA.—This inscription, originallv found in the course of excavation at Govindnagar and now preserved in the State Archaeological Museum at Mathura, is engraved in Brahmi script and Sanskrit on the pedestal of standing image of Buddha. It is dated in the year 115 (A.D. 192-93) probably of the Saka era Sravana 13th day and records that the image of Sakyamuni (i.e. Buddha) described as *dasabala-bali* was caused to be installed by *bhikshu* Samghavarman for the removal of all kinds

of sorrow and for the attainment of supreme knowledge of all the creatures. The image is stated to have been made by Aditta.

44. PEDESTAL INSCRIPTION, MATHURA, DISTRICT MATHURA.—This inscription is engraved on the pedestal of a broken image originally discovered at Govindnagar and now deposited in the State Archaeological Museum at Mathura. It is engraved in Brahmi script and Sanskrit and is dated in the year 121, probably of the Saka era (A.D. 198-99) coupled with the year 15, Margasira first day. It records that an image of Buddha was caused to be installed in the *Vira-datta-vihara* by Jiva, the daughter of Bhadrasinha for the merit of her parents and all beings.

45. GAHADWALA CHARTER, VARANASI, DISTRICT VARANASI.—This copper-plate inscription, in Sanskrit language and Nagari characters, records a land-grant made by king Govinda Chandra, son and successor of Madana Pala of Kannauj. Running into twenty-four lines, it is dated in Samvat 1184 (A.D. 1127-28). The seal, probably of the same copper-plate, bears the royal emblem of Garuda, *sankha* and a legend *Srimad Govinda Chandra Deva.* The ring which attached the seal with the copper-plate is, however, missing.

45. MALLA CHARTER, VARANASI, DISTRICT VARANASI.—This thirteen-line copper-plate inscription, in Sanskrit language and Nagari characters, records a land-grant made by *Maharajadhiraja* Sri Jaya Prakasa Malla Deva, the last ruler of Malla dynasty of Nepal. It bears the witness of Sri Raja Prakasa Malla Deva. Dated in Newara Samvat 862 (A.D. 1741-42), it is impressed with the royal seal on its upper left corner.

WEST BENGAL

47. PEDESTAL INSCRIPTIONS, CALCUTTA, DISTRICT CALCUTTA.—Two short inscriptions in proto-Bengali characters of the eleventh-twelfth century A.D. are engraved on the pedestals of stone sculptures of Vishnu and Karttikeya. The one on the pedestal of Vishnu image reads as *Om Bhatta Prabhakarasya,* while the other one as *Om danapati Bhaktidhara.*

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. EPITAPH AND INSCRIPTIONS, HYDERABAD, DISTRICT HYDERABAD.—The epitaph records the death of Karima Begam, stated to be the 'Begam of His Majesty the Sultan' (Nizam of Hyderabad?) in A.H. 1293 (A.D. 1876-77).

Of the two inscriptions, one recording a chronogram in Persian verse yielding A.H. 1052 (A.D. 1642-43) for the construction of the tomb of Hadrat Mumin Chup (lit. silent), contains a fragment of two verses in Dakani or Old Urdu. Another inscription records the death of Khwaja 'Ambar in A.H. 1194 (A.D. 1780).

2. EPITAPH, MAKAJGIRI, DISTRICT HYDERABAD.—This epitaph from the Hamlet Maula Ali of the village Makajgiri near Hyderabad, records the construction of a well at Koh-i-'Ali (lit.

[1]Information from: 6, 9, 18, Shri N. M. Ganam of the Western Circle of the Survey; 23, Shri Krishna Kumar, Registering Officer, Varanasi; and the rest are important ones among the four hundred inscriptions found, copied, examined and reported by Dr Z. A. Desai, Superintending Epigraphist for Arabic and Persian Inscriptions of the Survey, stationed at Nagpur, who was assisted by Shri M. F. Khan, Senior Epigraphical Assistant and Shri S. S. Husain and Dr M. Y. Quddusi, Epigraphical Assistants of the same office.

Hill of 'Ali) by Khushhal Khan, son of Karim Khan Dihlawi (i.e. of Delhi) in A.H. 1207 (A.D. 1792-93).

3. EPITAPHS, MASULIPATNAM, DISTRICT KRISHNA.—Among the number of epitaphs, set up in the early ninteenth century A.D. to mark the graves of persons, presumably traders of Iranian domicile or origin, are those of: Mirza Muhammad 'Ali Maskani Isfahani, Aqa Muhammad Isma'il Isfahani, Aqa Muhammad 'Ali Qazwini, Mirza Muhammad Nabi Shirazi, Aqa Muhammad Husain Isfahani, Mir Muhammad 'Ali al-Kazirani (al-Kazaruni ?), Aqa Muhammad Husain Maghara and Aqa Ibrahim Isfahani. Among the other epitaphs found at the same place are those of Mirza Zainu'l-'Abidin Intizam Jang Mubaraku'd-Daula, the Nawwab of Machhli-Bandar (died A.D. 1823), Fakhru'n-Nisa the 'Lady of the Time' (died, A.H. 1254/A.D. 1838), and Mir Muhammad Taqi 'Askari (died A.D. 1880), described as an expert wrestler and master of stick-wielding *(bannaut* or *chhari),* who was known by the title of 'City-master' *(Shahr- Us tad).*

BIHAR

4. INSCRIPTION, PATNA, DISTRICT PATNA.—This inscription records the construction of a mosque by Hakim Dhu'l-Faqar 'Ali Khan Ridawi al-Husaini Ithna'-ashari al-Akbarabadi (i.e. of Agra), built in A.H. 1264 (A.D. 1847-48) in the course of one year at a cost of rupees one thousand two hundred and fifteen only; it is stated to have been meant for himself and not for members of another sect.

DELHI

5. INSCRIPTION, DELHI.—This inscription, noticed earlier *(List of Muhammadan and Hindu Monuments in the Delhi Province,* vol. II, p. 157), containing verses in praise of Hadrat Nizamu'd-Din Auliya by Mir Nawidi of Nishapur, was found to bear the date A.H. 969 (A.D. 1561-62).

GOA, DAMAN AND DIU

6. INSCRIPTION, DIU.—This epitaph in Arabic in Naskh, records, besides quoting Quranic verses, the date of demise of a person as A.H. 777 (A.D. 1376).

GUJARAT

7. EPITAPHS, AHMADABAD, DISTRICT AHMADABAD.—The epitaphs in the Bohra graveyard, most of them set up in recent times, mark the last resting places of the chief and leading men of the community like Sayyidna Yusuf, Shaikh Adam, Maula'i Malik the Da'i, Miyan Fir (Pir) Khan the Da'i of Sindh, India and Yemen, Sayyidna Miyan Qasim, Qutbu'd-Din the Da'i Maulai Hasan, Amin Ji and the like who expired between A.H. 950 (A.D. 1543) and A.H. 1065 (A.D. 1655). One of these provides interesting information indicating that an unnamed pious person who was sent to India by the last Dai of Yaman to assess the faith and sincerity of (their Indian) brethern for the information of the people of Yemen who died after some stay at Ahmadabad.

The other epigraphs, found at the same place, include one which records the construction of a mosque by Muhammad Ghazi under the supervision of his brother Jan Muhammad in A.H. 1063 (A.D. 1652-53) and another recording the construction of a mosque by Shaikh Fath in A.H. 1073 (A.D. 1662-63). One more inscription records the construction of the gate of a

quarter (Mahalla) and the naming of that quarter as Lahori-Mahalla in A.H. 1116 (A.D. 1704-05).

8. INSCRIPTION OF THE MUGHALS, AHMADABAD, DISTRICT AHMADABAD.—This inscription in Persian verse of Farrukh Siyar, records the construction afresh, of a mosque—spoken of as a Ka'ba in Gujarat—by Ruhu'llah in A.H. 1129, being emperor's sixth regnal year (A.D. 1717), during the governorship of Maharaja Ajit Singh, when Nahir Khan was the Darugha of Kathra-Parcha. An interesting feature of the epigraphical tablet is that it also bears the text of the Arabic inscription, recording the construction of the original edifice of a Jami' mosque by Abu Ji'u Muhammad, entitled Malik Wajihu'1-Mulk in A.H. 979 (A.D. 1571-72).

9. INSCRIPTION, BHUJ, DISTRICT KUTCH.—This inscription, on the cannon in Persian Nastaliq, records that the cannon was cast at the capital Patan (Srirangapatna) in A.H. 1226 (A.D. 1798). It further quotes the name of its caster as Asad Hussain.

10. INSCRIPTION, KADI, DISTRICT MAHESANA.—This inscription from Qanati (one-wall) mosque near a grave, records the death of a lady named Hans Kunwar who died in A.H. 1212 (A.D. 1797-98).

11. INSCRIPTION, WADHWAN, DISTRICT SURENDRANAGAR.—This inscription recovered from an underground mosque at Wadhwan and now preserved in the Watson Museum, Rajkot, assigns the construction of the mosque to Khwaja Fakhr, son of Ula of Bahra'ich, in A.H. 887 (A.D. 1483).

JAMMU AND KASHMIR

12. EPITAPHS, CHITERGUL, DISTRICT ANANTNAG.—Among the number of epitaphs found at Chitergul, almost all of them are dated in the Hijra year and month and day and also contain the names of the day, the *paksha* and month of the Hindu calendar in Kashmiri language and in Arabic script. Belonging to the first half of the eighteenth century, they refer to Mir Muhsin (died A.H. 1120/A.D. 1708), Dost'Ali (died A.H. 1127/A.D. 1715), Baqir Mir (died A.H. 1134/ A.D. 1721), Sultan Mir (died A.H. 1137/A.D. 1725), Muhammad Mahdi (died A.H. 1137/A.D. 1725), Ja'far Mir (died A.H. 1138/A.D. 1726), Bulaqi Mir (died A.H. 1148/A.D. 1735), Baqir Mir (died A.H. 1150/A.D. 1738), Fath Malik, the Zamindar of Mazo (died A.H. 1151/A.D. 1738), Ashraf Mir (died A.H. 1155/A.D. 1742) and Husain Mir (died A.H. 1156/A.D. 1743).

13. EPITAPHS, SRINAGAR, DISTRICT SRINAGAR.—A number of epitaphs were copied from two old graveyards at Srinagar. These belong to men of some note: like Mir Ja'far who died in A.H. 982 (A.D. 1574-75) and the epitaph was set up by the deceased's servant Bihram; Bibi Baghdadi who died in A.H. 999 (A.D. 1590-91); Kulthum Agha, daughter of Khwaja Bahau'd-Din Husain al-Khadim al-Munshi, who died in A.H. 1000 (A.D. 1591); Sangin Beg who died in A.H. 1002 (A.D. 1593-94); and Isma'il Beg Khan Turkan who died in A.H. 1102 (A.D. 1691).

KARNATAKA

14. `ADIL SHAHI INSCRIPTIONS, MAMDAPUR, DISTRICT BIJAPUR.—One of the two inscriptions of the time of Muhammad 'Adil Shah, found on the larger village tank, records its excavation, started in A.H. 1043 (A.D. 1633-34) and named `Haud-I-Sultan Begam', after the wife of the Prime Minister Khwwass Khan by the latter at the instance of the king at a cost of fifty thousand Hons (cf. *District Gazetteer Bombay Presidency,* vol. XXIII, Bijapur, Bombay, 1884,

p. 663). The second epigraph, now fixed up on the village mosque, noticed for the first time, and reported to have brought from the smaller tank, contains the same text except the date A.H. 1044 (A.D. 1634-35).

15. INSCRIPTION OF THE MUGHALS, BILGI, DISTRICT BIJAPUR.—This inscription (pl. LIX A) states that Nawwab Diler Khan, son of `Abdu'l-Karim Buhlul Khan Miyana, granted *four chawars* of land in the village *(qasba)* Bilgi in *pargana* Bakarotah (Bagalkot?) to his servant Bisaji Pandit, son of Mohdaji and grandson of Babaji, a Patalshahi Rugb(w)edi Brahmin (zunnardar), in the 51st regnal year of Aurangzeb corresponding to A.H. 1119(?) (A.D. 1707), and that the grantee, out of his personal earned income, excavated a step-well and laid out a garden for his merit in the next world, under the supervision of his nephew Kishnaji son of Raghunath; it ends with a curse of divorce for the intruders, whether a Hindu or a Muslim.

MAHARASHTRA

16. INSCRIPTION OF THE MUGHALS, PACHAD, DISTRICT KOLABA.—This epitaph (pl. LIX B) found at Pachad near Raigadh fort records the construction of a fort at Raheri called Islamgadh, in A.H. 1107 (A.D. 1695-96) in the time of emperor 'Alamgir (Aurangzeb), by Haji 'Abdu'r-Razzaq; its metrical text was composed by Mu'jiz.

ORISSA

17. INSCRIPTIONS OF THE MUGHALS, CUTTACK, DISTRICT CUTTACK.—Among the three epigraphs, the one of the time of Aurangzeb records the construction of a mosque by Mirza Jafar the Waziru'1-Mulk (Minister of the Kingdom) in A.H. 1079 (A.D. 1668-69). Another inscription records the building of a mosque in A.H. 1102 (A.D. 1690-91) by Sahibzada Muhyiu'd-Din. The third inscription dated in the reign of 'Alamgir II states that the Drum-House *(Naubat Khana)* in the premises of the court of the Lord of two worlds the Prophet (i.e. Qadam-Rasul) was built by Didar 'Ali son of Din Muhammad in A.H. 1169 (A.D. 1755-56).

RAJASTHAN

18. INSCRIPTION, CHITTAURGARH, DISTRICT CHITTAURGARH.—This Arabic inscription in the characters of the fourteenth century contains a maxim on the futility of the world.

TAMIL NADU

19. INSCRIPTION OF THE SULTANS OF MADURAI, MADURAI, DISTRICT MADURAI.—This fragmentary inscription, containing few honorific regal titles, is assignable to the fourteenth century A.D.

20. EPITAPHS AND INSCRIPTIONS, ARCOT, DISTRICT NORTH ARCOT.—A number of epitaphs, among others, of saintly and other prominent persons were found at Arcot. Among the saints represented are Sadiq Shah who died in A.H. 1128 (A.D. 1715-16), Tipu Shah who died in A.H. 1141 (A.D. 1728-29), an unnamed saint who came to and lived at Arkat (Arcot) for six years and died in A. H. 1144 (A.D.' 1731-32) and construction of his tomb by Haji Husain completed two years later, Husain Shah who died in A.H. 1149 (A.D. 1736-37) and construction of his tomb in A.H. 1185 (A.D. 1771-72) and among the prominent or learned men are Sa'adatu'llah Khan who died in A.H. 1144 (A.D. 1731-32) and also built, according to other inscriptions, a mosque and the tomb of saint Tipu at Arcot in A.H. 1141 (A.D. 1728-29), Sayyid Asadu'llah Khan of

'lofty rank' who died in A.H. 1179 (A.D. 1765), Khwaja Isma'il Baig who died in A.H. 1182 (A.D. 1769) and Shaikh Muhammad Talmisani, a learned servant who died in A.H. 1201 (A.D. 1786-87). Besides, a one-verse epitaph, dated A.H. 1144 (A.D. 1731-32), is in Dakani or old Urdu.

An inscription from Arcot states that in the *one-bigha* land, adjacent to the Kotwali office *(chabutara)* which was granted in A.H. 1157 (A.D. 1744) by Nawwab Da'ud Khan for the burial-place of Mandu Kanchani, sweet water was brought in the old Kunther canal for the use at (her?) tomb, at a cost of rupees twelve thousand in A.H. 1159 (A.D. 1746). The epigraph seems to describe the beneficiary of the grant as the wife of Shaikh Muhammad Husain. Yet another inscription from Arcot forms the text of a legal declaration made in A.H. 1170 (A.D. 1756-57) to the effect that one house was purchased from Kamal Muhammad by Mir Fadl-i-'Ali who was buried therein after his death in A.H. 1168 (A.D. 1754-55); it was set up by a servant of the deceased's father.

21. EPITAPHS, VELLORE, DISTRICT NORTH ARCOT.—A number of epitaphs, among others, of saintly and other prominent persons were found at Vellore. Among the saints represented in the epitaphs are Shah 'Abdu'l-Latif who died in A.H. 1150 (A.D. 1737-38), Shah Ruknu'd-Din Abu'l-Hasan Qurbi who died in A.H. 1182 (A.D. 1768-69), and Muhyiu'd-Din Dhawaqi who died in A.H. 1194 (A.D. 1780), and among the prominent personages mention may be made of Hakim 'Ali Akbar who died in A.H. 1169 (A.D. 1755-56) and members of the family of Sultan Tipu, namely Bakshi Begam, wife of Haidar 'Ali and mother of Tipu Sultan of Mysore, who died in A.H. 1219 (A.D. 1804-05 and construction of her tomb three years later), Mirza Rida Husain who died in A.H. 1247 (A.D. 1831-32), Fardu'llah Khan who died in A.H. 1248 (A.D. 1832), Sultan Fatima Begam who died in A.H. 1250 (A.D. 1834-35) and Tipu's wife Badshah Begam who died in A;H. 1250 (A.D. 1834-35).

UTTAR PRADESH

22. EPITAPH AND INSCRIPTION, ALIGARH, DISTRICT ALIGARH.—The epitaph records the demise of Mirza Husain Bakhsh in A.H. 1195 (A.D. 1781) and another inscription states that the 'Idgah which was first constructed by Ikhtiyar Khan was reconstructed by Sardar Khan Mewati in A.H. 1211 (A.D. 1796-97).

23. INSCRIPTIONS, KALINJAR, DISTRICT BANDA.—The Persian inscription on the southern entrance of a dilapidated medieval building, west of the Pathar Mahala mosque inside the fort, runs into six lines in Nastaliq characters and mentions the name of Sarkar Nawwab Qasim 'Ali Khan Makki, and is dated A.H. 826 (A.D. 1412-13). Another inscription is on the wall of an open-air mosque in the fort.

24. EPITAPH, MATHURA, DISTRICT MATHURA.—This epitaph is of a person of Iranian domicile, named Abu Talib Baig, an inhabitant of Banshin in the vicinity *(mahal)* of the town of Nishapur.

FRENCH AND PORTUGUESE INSCRIPTIONS[1]

GOA, DAMAN AND DIU

1. PORTUGUESE INSCRIPTION, MOTI DAMAN.—This inscription records the conquest of the Fort of Abysainian Sidi Bofeta (Sidi Miftah) by the Portuguese in A.D. 1559.

[1]Information from : 1,2, Shri N. M. Ganam of the Western Circle of the Survey; and 3, the Chief Epigraphist of the Survey.

GUJARAT

2. PORTUGUESE INSCRIPTION, BHUJ, DISTRICT KUTCH.—This inscription on the cannon bears the date A.D. 1622.

PONDICHERRY

3. FRENCH COPPER-PLATE INSCRIPTION, PONDICHERRY.—This copper-plate inscription in French language and Roman characters, dated A.D. 1870, in the reign of Nepoleon III records the erection of a statue at Pondicherry in the memory of Marquis Dupleix.

III. NUMISMATICS AND TREASURE TROVE[1]

GUJARAT

1. MUGHAL COINS, KANKARIA, DISTRICT AHMADABAD.—One hundred twenty-one silver coins of Mughal times were found at Picnic House area.

2. JAINA IMAGES, SOL, DISTRICT AHMADABAD.—Five Jaina images in marble, belonging to *circa* fifteenth century A.D., were found as treasure trove.

3. SCULPTURES, DETHALI, DISTRICT BANAS KANTHA.—An image of Jaina *Tirthankara,* a fragment of *torana* and an inscribed *asanapatta,* all in marble, belonging to *circa* thirteenth century A.D., were found as treasure trove.

4. JAINA IMAGES, DHOTA-SAKALANA, DISTRICT BANAS KANTHA.—Two Jaina images in marble, belonging to *circa* fifteenth century A.D., were found as treasure trove.

5. SCULPTURE, ANKALESHWAR, DISTRICT BHARUCH.—A huge sculpture of Nandi in sand stone, belonging to medieval period, was found as treasure trove.

6. SCULPTURES, AJARA, DISTRICT JUNAGADH—Two *toranas* of Jina Parikar and one Pabasan, carved in white marble and belonging to *circa* thirteenth century A.D., were found as treasure trove.

7. COINS AND SCULPTURE, KERA, DISTRICT KUTCH.—One thousand three hundred and two silver coins of Muslim rulers and an image of Tapas of sandstone, belonging to *circa* sixteenth century A.D., were found as treasure trove.

8. SCULPTURE, VADODARA, DISTRICT VADODARA.—A fragment of door-jamb in sands-stone, belonging to *circa* fifteenth century A.D., was found as treasure trove.

HIMACHAL PRADESH

9. COINS OF RAJAS OF KANGRA, REY, DISTRICT KANGRA.—A hoard of six hundred and twenty-seven copper coins of Rajas of Kangra issued from eleventh to fourteenth century A.D. were found as treasure trove and are now preserved in the State Museum, Simla. The coins are of 'horseman and bull' type and the standard is also similar to the coins of the Hindu Shahis.

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[1]Information from: 1-8, the Director of Archaeology and Museums, Government of Gujarat; 9-11, the Department of Languages and Cultural Affairs, Government of Himachal Pradesh; 12-18, the Director of Archaeology and Museums, Government of Karnataka; 19, Superintending Archaeologist of the Central Circle of the Survey; 20, 23, 24, Professor Ajay Mitra Shastri of the Department of Ancient Indian History, Nagpur University; 21, Dr (Shrimati) Shobhana Gokhale, Deccan College Post-graduate and Research Institute, Pune; 22, the Director of Tourism and Cultural Affairs, Government of Orissa; 25-30, the Director, State Museum, Government of Uttar Pradesh; and 31, the Director of Archaeology, Government of West Bengal.

10. COPPER COINS, NOHRA KHANDOL, DISTRICT SOLAN.—A hoard of seventy-five copper coins, issues of Sher Shah Suri and Emperor Akbar, were received as treasure trove finds and are now preserved in the State Museum, Simla.

11. MUGHAL COINS, RAMSHAHR, DISTRICT SOLAN.—A hoard of thirty-four silver coins, issues of the later Mughal rulers, were received as treasure trove finds and are now preserved in the State Museum, Simla.

KARNATAKA

12. SILVER COINS, NIRNA, DISTRICT BIDAR.—Forty-six silver coins of the rulers of Bahmani kingdom, who ruled the Deccan from A.D. 1347 to 1526, were received as treasure trove finds.

13. ROMAN GOLD COINS, AKKI ALUR, DISTRICT DHARWAR.—A hoard of forty-six gold coins (pi. LX) including issues of Augustus (29 B.C.-A.D. 14), Antonius Pius (A.D. 138-161), Theodosius II (A.D. 408-450), Marcian (A.D. 450-474), Zeno (A.D. 474-491), Anastasius (A.D. 491-518) and Justinus I (A.D. 518-527).

14. GOLD COINS, PULIGAPANAHALLI, DISTRICT KOLAR.—Ninty gold coins including two of Kanthiraya and eighty-eight of Tipu Sultan, out of which two are *the panams* of Tipu Sultan bearing the name of the mint as Kalikoot (Calicut) and dated A.H. 1200 (A.D. 1785) and A.H. 1217 (A.D. 1802), were received as treasure trove finds.

15. COPPER COINS OF CHOLAS, MYSORE, DISTRICT MYSORE.—Eight copper coins of Chola period were received as donation by Shri Mohammad Qasim of Mysore.

16. MUGHAL COINS, KURADI, DISTRICT RAICHUR.—Ten silver coins of Mughal rulers, bearing the name of Shah Alam Ghazi, date A.H. 1214 (A.D. 1759), and issued during the rule of Azeemuddin Alamgir II, were received as treasure trove finds.

17. COINS AND ORNAMENTS, CHIKKALIVANA, DISTRICT SHIMOGA.—Gold and silver coins and ornaments found in the premises of Virabhadra Devara temple were acquired under the Treasure Trove Act.

18. VIJAYANAGARA GOLD COINS, MANGALORE, DISTRICT SOUTH KANARA.—Seventy-three gold coins of Vijayanagara times were received from the Deputy Commissioner of the District as treasure trove finds.

MADHYA PRADESH

19. COPPER COINS, MALHAR, DISTRICT BILASPUR.—Nine square copper coins with legends in Brahmi characters of first century A.D. and six circular copper, coins, datable to *circa* eleventh century A.D. were discovered. Of these, one square copper coin bears the legend *Kumaghabhij-habha.*

20. COINS OF SIMHENDRAPALA, CENTRAL INDIA.—Dr Ajay Mitra Shastri identified two silver coins of a hitherto unknown chief Simhendrapala. The coins are of the seated goddess type and have the legend in Brahmi characters of about twelfth-thirteenth century A.D., giving the king's name on the obverse and bearing a four-armed seated goddess (Lakshmi) on the reverse. Their provenance is not known, but they appear to have been found somewhere in central India where this type was popular.

MAHARASHTRA

21. SILVER COINS, NASIK, DISTRICT NASIK.—Dr (Shrimati) Shobhana Gokhale of the Deccan College Post-graduate and Research Institute, Pune, identified three rare silver coins, issues of Satavahana rulers Vasishthiputra Pulumavi, Khada Satakarni and Gautamiputra Yajnasri Satakarni, in the coin cabinet of Shri P. C. Chumbule from Nasik.

ORISSA

22. COPPER COINS, BANTTIA, DISTRICT BALASORE.—Copper coins in three hoards, containing more than one thousand coins, belonging to the Kushana dynasty and, datable to *circa* fourth century A.D. were found as treasure trove finds and are now under the Police custody at Bhadrak.

UTTAR PRADESH

23. COIN OF KOKADEVA, KAUSAMBI, DISTRICT ALLAHABAD.—A copper coin of king Kokadeva, who was not known so far from any other source, datable to *circa* second-first century A.D., was noticed in a private collection at Varanasi by Dr Ajay Mitra Shastri.

24. COINS OF VIJAYANANDIN, KAUSAMBI, DISTRICT ALLAHABAD.—Nine copper coins of Vijayanandin, a hitherto unknown king of Kausambi, belonging to the early centuries of the Christian era, prior to the annexation of Kausambi region in the Gupta empire, were noticed in a private collection at Varanasi by Dr Ajay Mitra Shastri.

25. COPPER VASE AND COINS, BHATPARRANI, DISTRICT DEORIA.—A copper vase and eighteen copper coins of Sarqi dynasty were received as treasure trove finds.

26. SILVER IMAGE AND OTHER OBJECTS, BAOSHADI, DISTRICT TEHRI-GARHWAL.—One silver image, three umbrellas and a *kulphi* were received as treasure trove finds.

27. COINS AND EAR-RINGS, BHANDRA, DISTRICT HAMIRPUR.—Eleven alloy coins and two ear-rings in brass, belonging to medieval period (Indo-Sassanian), were received as treasure trove finds.

28. COINS AND OTHER OBJECTS, HAMIRPUR, DISTRICT HAMIRPUR.—Under the Treasure Trove Act, the following objects, including two gold coins, one each of Chandragupta and Vikramaditya, seventy-two silver coins of the rulers of the Native State and a brass vase, two copper coins of Suri dynasty, ten brass rings and two armlets, five silver coins of East India Company, a necklace, two pieces of armlets, two broken ear-rings, were received.

29. COINS, GOVINDNAGAR, DISTRICT MATHURA.—One thousand five hundred and forty-one copper coins of later Kushana period, twenty-three silver coins, eight copper coins and one billon coin, were received as treasure trove finds.

30. COINS, SAHARANPUR, DISTRICT SAHARANPUR.—Twenty-eight silver coins, thirty-three gilt coins and one thousand six hundred and ten modern coins were received as treasure trove finds.

WEST BENGAL

31. GOLD COINS, HASNAN, DISTRICT HOOGHLY.—Eleven gold coins of the Gupta period (pi. LXI) received as treasure trove finds include: four archer-type issues of Chandra Gupta II; one with king riding a galloping steed on the obverse and goddess feeding peacock on the reverse, issue of Kumara Gupta I; two archer-type issues of Narasimha Gupta (Baladitya); one archer-type issue of Kumara Gupta III: one archer-type of Vishnu Gupta; one archer-type of Samacharadeva (Narendravinata); and one unidentified coin.

IV. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. STRUCTURES, RELIC-CASKETS AND BRONZE IMAGE, GUNTUPALLI, DISTRICT WEST GODAVARI.—During the course of clearance work near the *stupa-complex* in the monastic area, ruins of a limestone pillared hall and basal courses of the cells of the monastery were exposed. Three caskets of copper, silver and gold, kept inside one another, with relics in the innermost golden casket, were recovered along with a terracotta *stupa-model* near the *stupa* site. Besides, a bronze image of Bodhisattva Padmapani (15.5 X 8 X 8 cm), seated in *rajalilasana* on *padma-pitha* with *prabhamandala* and seated devotee in meditating posture to his left, and with inscrip tion over the lotus petals, reading a Buddhist creed formula *He-dharma hetu prabhava* in Nagari characters of ninth-tenth century A.D., was also recovered.

BIHAR

2. SCULPTURES AND BRONZE IMAGE, JAMTHARI AND RAKHWARI, DISTRICT MADHUBANI. Shri B. S. Jha of the Mid-eastern Circle of the Survey, noticed a number of sculptures, including Surya, Vishnu, in black basalt at Rakhwari, and a miniature bronze image of Buddha and an inscribed *ekamukha Siva-linga* at Jamthari.

GUJARAT

3. HARAPPAN SITE, BHIMNATH, DISTRICT AHMADABAD.—Shri K. D. Tripathi of the Western Circle of the Survey noticed Harappan site called Jhaloriano Tekro at Bhimnath.

4. EARLY HISTORICAL SITE, GANOT, DISTRICT AHMADABAD.—Shri K. D. Tripathi of the Western Circle of the Survey noticed an early historical site at Ganot.

5. HARAPPAN SEALS, LOTHAL, DISTRICT AHMADABAD.—The Superintending Archaeologist of the Western Circle of the Survey recovered four Harappan seals and other antiquities during the filling up of the excavated area at Lothal.

6. SCULPTURE, BHARUCH, DISTRICT BHARUCH.—The Director of Archaeology, Government of Gujarat, noticed a sculpture of Siva and fragment of door-jamb in red sandstone, belonging to *circa* fifteenth century A.D.

7. HARAPPAN ANTIQUITIES, NETRA KHIRASARA, DISTRICT KUTCH.—Shri N. M. Ganam of the Western Circle of the Survey, while reexploring the site, encountered a cubical weight of substantive size, chanks and pottery of the Harappan period, besides sprinklers and spouts of red polished ware of early historical times.

The Director of Archaeology, Government of Gujarat, recovered a survey instrument, comparable to the modern prismatic compass from the site called Gadh-vali vadi.

8. SCULPTURES, VARANA, DISTRICT VADODARA.—The Director of Archaeology, Govern ment of Gujarat, noticed at Varana sculptures of Brahmi and *Vinadhara* Siva, belonging to *circa* eighth century A.D., and Uma-Mahesvara, belonging to *circa* fifteenth century A.D., all of sandstone.

HIMACHAL PRADESH

9. EARLY HISTORICAL STRUCTURES, DATANAGAR, DISTRICT SIMLA.—Dr V. C. Ohri of the State Museum, Government of Himachal Pradesh, noticed remains of brick (40 X 25 cm) structures, belonging to *circa* sixth century A.D., at the site on the bank of the river Sutlej.

JAMMU AND KASHMIR

10. SCULPTURES, DUMATBAL, DISTRICT ANANTNAG.—Shri Sardari Lai Shali of the Frontier Circle of the Survey, noticed sculptures in black stone, including Vishnu (one standing and the other seated on Garuda), Harihara, Lakshmi, Mahishasuramardini, and *Seshasayi-Vishnu,* all datable to *circa* tenth century A.D.

11. ANCIENT SITE, KANYALWAN, DISTRICT ANANTNAG.—Shri Sardari Lai Shali of the Frontier Circle of the Survey discovered an ancient site at Kanyalwan on the Bijbihara-Pahalgam road, yielding pottery similar to the one recovered from the lower levels at Martand and Periods II and III at Burzahom. The shapes include straight-sided and carinated bowls, vases with prominent necks, basins having ledge near waist region. Besides sherds with bright red slip having thumb-nail pattern, black-and-red ware bowls with inturned rim and a dull gritty red ware were also found. Among the antiquities from the site, mention may be made of stone pestle with rectangular cross-section and stone ball.

12. SCULPTURE, KOTI-TIRTHA, DISTRICT BARAMULLA.—The Superintending Archaeologist of the Frontier Circle of the Survey noticed an *ekamukha Siva-linga* on the right bank of the river Jhelum (ancient Vitasta).

13. SCULPTURES, SOURA, DISTRICT SRINAGAR.—The Superintending Archaeologist of the Frontier Circle of the Survey, noticed three stone sculptures of Buddha and Bodhisattva and terracotta head of Buddha with *ushnisha* and halo behind the head, at Soura, recovered during the course of construction work of the Sher-i-Kashmir Medical Institute.

KARNATAKA

14. MEDIEVAL SITE AND SCULPTURES, HOLE NAGALAPURA, DISTRICT BELGAUM.—Dr A. Sundara of the Department of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar, noticed a medieval site and a sculpture of Surya, standing in two-wheeled chariot drawn by seven horses, datable to eleventh-twelfth century A.D.

15. SCULPTURE, ITAGI, DISTRICT BELGAUM.—Dr A. Sundara of the Department of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar, noticed a colossal Vishnu sculpture with miniature reliefs of his twelve *avataras* on the *prabhavali,* datable to *circa* twelfth century A.D.

16. MEDIEVAL SITE, KENGANUR, DISTRICT BELGAUM.—Dr A. Sundara of the Department of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar, noticed a medieval site.

17. TEMPLE AND SCULPTURES, SANGOLLI, DISTRICT BELGAUM.—Dr A. Sundara of the Department of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar,

noticed a temple, datable to tenth-eleventh century A.D. and sculptures of two-armed Ganesa and a colossal Hanuman with inscription of *circa* twelfth century A.D.

18. TEMPLE AND SCULPTURE, TURMURI, DISTRICT BELGAUM.—Dr A. Sundara of the Depart ment of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar, noticed a temple of medieval period and a sculpture of Karttikeya.

19. MEDIEVAL TEMPLES, SIRUR, DISTRICT BIJAPUR.—Shri S. V. Padigar, Research Fellow of the Department of Ancient Indian History and Epigraphy of the Karnatak University, Dharwar, noticed two rare temples, datable to *circa* eleventh century A.D. One of them, locally known as Siddhesvara temple, is a complex having a central shrine facing west, dedicated to Siva, and four subsidiary shrines at the corners. The temple consists of *grabhagriha, antarala, sabha-mandapa* with a sub-shrine attached to it, *mukha-mandapa* and *mahadvara.* The *garbhagriha* is crowned with *rekha-nagara sikhara,* which is rarely adopted in later Chalukya temples, while the subsidiary shrines have *Kalinga-type* of *sikhara.* All the shrines now house *lingas,* but, originally, except the central one, the other shrines were dedicated to various deities. An inscription on the wall of the main temple refers to the renovations executed in the reign of Somesvara I, the Chalukya king of Kalyana, in A.D. 1049. The other temple, dedicated to Ganesa, consists of only a square hall with entrance on the north with four pillars of later Chalukya style in the centre, and houses an image of Ganesa, also of later Chalukya style. The side walls are decorated with perforated windows, while the roof is flat and square at the centre and sloping on all the four sides. This temple is probably the Vinayaka temple referred to in the inscription mentioned above. Besides, some inscribed and uninscribed hero-stones belonging to *circa* eleventh-twelfth century A.D. as well as an inscription, dated A.D. 1154, were also noticed.

MADHYA PRADESH

20. MEDIEVAL SCULPTURES, BHOPAL, DISTRICT BHOPAL.—Sarvashri M. D. Khare and B. L. Nagarch of the Central Circle of the Survey noticed several sculptures of Hindu pantheon, unearthed while digging the foundation at Azad Market, noteworthy among them being those of Brahma, Siva, head of a deity with bulging eyes and open mouth and four-armed flying Garuda.

21. STONE AGE TOOLS AND ANTIQUITIES, MALHAR, DISTRICT BILASPUR.—Shri A. P. Sagar of the Central Circle of the Survey, collected Lower Palaeolithic and Mesolithic tools, terracotta figurine of *Naga-mithuna,* beads of semi-precious stones and terracotta and other objects, belonging to the Mauryan period.

22. MEDIEVAL TEMPLE AND SCULPTURES, BARAUNI-KHURD, DISTRICT DATIA.—Shri B. L. Nagarch of the Central Circle of the Survey discovered a Jaina temple dedicated to Adinatha along with sculptures of Jaina *Tirthankaras,* Vishnu, Vaishnavi, Siva Uma-Mahesvara, Parvati, Nandi and Surya.

23. MEDIEVAL TEMPLE AND SCULPTURES, BEEJAWADA, DISTRICT DEWAS —Shri A. P. Sagar of the Central Circle of the Survey discovered ruins of a temple and sculptures of Jaina *Tirthankaras,* belonging to *circa* eleventh century A.D.

24. MEDIEVAL TEMPLE AND SCULPTURES, MANDHATA, DISTRICT EAST NIMAR.—Shri B. L. Nagarch of the Central Circle of the Survey noticed ruins of two temples, one located to the west of the gigantic Chamunda sculpture, and the other at Panthiya, locally known as Dera.

Besides, sculptures of eight-armed Ganesa, Bhairava, Mahishasuramardini, Varahi, Mahesvari, Niriti, Kubera and Bhairava were also noticed.

Shri A. P. Sagar of the Central Circle of the Survey noticed in the Brahmapuri area two colossal images of dancing Ganesa and Hanuman, belonging to *circa* eleventh century A.D.

25. PAINTED ROCK-SHELTERS, GOPISAR, DISTRICT RAISEN.—Shri A.P. Sagar of the Central Circle of the Survey discovered about fifty painted rock-shelters at Mahadeva Pani and Chundelan-ki-dant. Their exact age, however, remains to be determined.

26. STONE AGE TOOLS, MENDKI, DISTRICT RAISEN.—Shri A.P. Sagar of the Central Circle of the Survey collected Lower and Middle Palaeolithic and Mesolithic tools.

27. MEDIEVAL SCULPTURES, NARAPURA, DISTRICT RAISEN.—Shri A. P. Sagar of the Central Circle of the Survey noticed a capital of a pillar probably belonging to eleventh-twelfth century A.D., carved with incarnations of Vishnu on four faces.

28. ROCK-CUT SCULPTURES, PACHMARHI, RAISEN AND SITATALAI DISTRICT RAISEN.—Shri A.P. Sagar of the Central Circle of the Survey discovered two rock-cut sculptures (pl. LXII) of Ambika in *ardhaparyankasana,* standing male belonging to *circa* sixth-seventh century A.D. and pillars inscribed in Devanagari characters of thirteenth century A.D.

29. BRICK TEMPLE AND TERRACOTTA IMAGES, INDHAR, DISTRICT SHIVPURI.—Shri B. L. Nagarch of the Central Circle of the Survey noticed remains of a brick temple and terracotta images, assignable to the Gupta period. Noteworthy among the terracottas are a bust of a female with prominent breasts, head of a deity with open mouth, an ascetic holding a manuscript in his left hand. Besides, a number of bricks carved with diamond design were also noticed.

30. PAINTED ROCK-SHELTERS, AHMADPUR, DISTRICT VIDISHA.—Shri M.D. Khare of the Central Circle of the Survey discovered a number of rock-shelters with paintings including animals such as bison, elephant, deer and human figures, depicted in single or in rows, standing, dancing and hunting postures. The paintings are done in red, deep red, yellow or white, green, sometimes with superimposition. An inscription in Brahmi characters of *circa* first century A.D., painted in red, was also noticed.

31. SUNGA RAILING PIECE, BES, DISTRICT VIDISHA.—Dr V. S. Wakankar of the Vikram University, Ujjain, and Shri B.K. Sinha of the Central Circle of the Survey noticed a *suchi,* datable to the Sunga period, on a small mound situated across the river at Bes.

32. PAINTED ROCK-SHELTERS, NEEMKHERIA, DISTRICT VIDISHA.—Shri B. K. Sinha and Narayan Vyas of the Central Circle of the Survey along with Shri M. K. Maheswari of Vidisha, discovered twenty rock-shelters, some of which having paintings in white, red and yellow, depicting man riding an animal, man riding a horse and thrusting a spear into the body of a deer, an archer shooting arrows, human figures, deer, humped bulls and tree-in-railing.

33. STONE AGE TOOLS, MEDIEVAL TEMPLE AND SCULPTURES, PATHARI, DISTRICT VIDISHA.—Shri A.P. Sagar of the Central Circle of the Survey collected Lower and Middle Palaeolithic and Mesolithic tools, while Shri B. L. Nagarch of the same Circle noticed a medieval Siva temple with sculptures of *sarvatobhadra* image of Surya, *apsaras,* Mahishasuramardini, Nataraja, Chamunda, Parvati, Ganesa and seated Sarasvati. A sculpture of Buddha seated in *bhumisparsa-mudra* was also noticed.

34. GUPTA SCULPTURE, SONPURA, DISTRICT VIDISHA.—Sarvashri B. L. Nagarch, B.K. Sinha and Narayan Vyas of the Central Circle of the Survey, along with Shri M. K. Maheswari of Vidisha, noticed an abacus of the capital of a pillar of Gupta period, lying on a mound near Sonpura. All the four faces of the abacus are decorated with two seated lions on each side and *kirtimukha* in the centre, holding their tails.

35. STONE AGE TOOLS, SOTHIYA, DISTRICT VIDISHA.—Shri Narayan Vyas of the Central Circle of the Survey collected Lower and Middle Palaeolithic and Mesolithic tools in the area around the village.

36. MEDIEVAL SHRINE, UDAIPUR, DISTRICT VIDISHA.—Shri B. L. Nagarch of the Central Circle of the Survey noticed a shrine, datable to *circa* ninth century A.D. The exterior walls of the shrine are decorated with *chaitya-arches, udgamas* and diamond designs. The door-jambs are decorated with foliage design.

MAHARASHTRA

37. STUPA STRUCTURE, NAGARA, DISTRICT BHANDARA.—The Central Museum, Nagpur, conducted trial digging at Nagara and exposed a structure which could be identified as *stupa*.

38. STONE AGE TOOLS, DESAIGUNJ (WADSA), DISTRICT CHANDRAPUR.—Shri S. N. Raghunath of the Survey collected Mesolithic tools from the secondary silt deposit of the river Vainganga.

39. STONE AGE TOOLS, PAPAMIYA TEKADI, DISTRICT CHANDRAPUR.—Shri S. N. Raghunath of the Survey discovered two more localities, yielding flake tools, mostly cleavers and smaller blade elements showing techno-typological development, besides confirming the earlier report of the existence of a rich Lower Palaeolithic site.

40. MEDIEVAL SITE, KANDHAR, DISTRICT NANDED.—Dr (Shrimati) Shobhana Gokhale of the Deccan College Postgraduate and Research Institute, Pune, visited the site Kandhar, probably the ancient city Kandharapur which was a secondary capital of the Rashtrakutas during the times of the king Krishna III, and noticed remains of a gigantic image, probably of a *Yaksha* or *Kshetrapala* mentioned in inscriptions, *Tagattungasamudra,* ruins of market-place, pavilion *(sarvalokasraya-mandapa),*_ fire-place *(agnisthitlka),* area where the chief courtesan of the king lived *(pradhana-rajavilasini-pataka),* water centres, etc., besides many ruined temples and structures.

41. MIDDLE PALAEOLITHIC TOOLS, KOLVAD, DISTRICT RATNAGIRI.—Shri S. N. Raghunath of the Survey collected Middle Palaeolithic tools, mostly points and untouched blades, on green jasper and chalcedony.

PUNJAB

42. LATE HARAPPAN AND OCHRE-COLOURED WARE SITE, KUMKALAN, DISTRICT LUDHIANA.—Shri Devendra Handa, B.T.T. College, Sardarshahr (Rajasthan), discovered an extensive mound yielding late Harappan pottery, ochre-coloured ware, early historical and medieval pottery. The site is rich in ochre-coloured ware.

43. SEAL AND INSCRIBED LID, SANGHOL, DISTRICT LUDHIANA.—One seal in lead, having

inscription in three lines in Kharoshthi script of the second century B.C., *reading Sphilikas Dharam-siva Kushala agramval,* meaning that the benefits of good deed should go to Sphilikas and Dharam-siva, and one lid of a pot, probably casket, inscribed in Kharoshthi script of second-third century B.C., reading *Upasaka susa bhadrasa,* were found from the site by the Department of Tourism, Cultural Affairs, Archaeology and Museums, Government of Punjab.

44. SEALINGS AND COPPER COINS, SUNET, DISTRICT LUDHIANA.—Shri C. L. Suri of the Frontier Circle of the Survey collected two sealings and a few copper coins, belonging to early historical period, from a site at Sunet near Ludhiana.

RAJASTHAN

45. GREY WARE SITE, DHAN KAREWARA, DISTRICT ALWAR.—Shri R. P. Sharma of the Survey, assisted by Shri M. G. Sharma, discovered an ancient site in the Garh (Parasnagar) valley yielding grey ware and also early historical and medieval pottery.

46. GREY WARE SITE, DHUDEWALA, DISTRICT ALWAR.—Shri R. P. Sharma of the Survey, assisted by Shri M. G. Sharma, discovered an ancient site in the Garh (Parasnagar) valley yielding grey ware and also early historical and medieval pottery.

47. GREY WARE SITE, PURANA GARH, DISTRICT ALWAR.—Shri R. P. Sharma of the Survey, assisted by Shri M. G. Sharma, discovered an ancient site in the Garh (Parasnagar) valley, yielding sherds of Painted Grey Ware, grey ware, early historical and medieval pottery.

48. MEDIEVAL SITES, PALIWAL, DISTRICT JAISALMER.— Sarvashri D. R. Gehlot, H. S. Sampathkumaran and M. G. Vyas of the Western Circle of the Survey discovered a number of temples, forts, cenotaphs, inscriptions, structures, tanks, wells, irrigation systems, etc., in the villages around Paliwal.

49. COPPER COINS, DHANASIA, DISTRICT SRIGANGANAGAR.—Shri Devendra Handa of the B.T.T. College, Sardarshahr, collected a few copper coins of queen Somaladevi from the ancient mound at Dhanasia.

50. COPPER COINS, PALLU, DISTRICT SRIGANGANAGAR.—Shri Devendra Handa of the B.T.T. College, Sardarshahr, collected a few copper coins of queen Somaladevi from the ancient mound at Pallu.

TAMIL NADU

51. COINS, GINGEE, DISTRICT SOUTH ARCOT.—One hundred and forty-nine coins, belonging to the Muslim and Nayaka rulers, were discovered by the Southern Circle of the Survey, while clearing the debris in the Palace site.

52. COPPER COINS, DARASURAM, DISTRICT THANJAVUR.—A hoard containing three hundred and eighty-five copper coins, in an earthern pot, was unearthed by the Southern Circle of the Survey while laying hume pipe for the drainage from *prakara* of Amman shrine and Airavatesvara temple.

UTTAR PRADESH

53. MEDIEVAL SCULPTURES, JOTANA, DISTRICT AGRA.—Shri J. P. Srivastava of the

Northern Circle of the Survey discovered at Jotana, a number of medieval sculptures, of which a colossal Hanuman figure is noteworthy.

54. MEDIEVAL REMAINS, NAGAR, DISTRICT AGRA.—Shri J. P. Srivastava of the Northern Circle of the Survey noticed medieval temples which had subsequently been converted into mosques during the Sultanate period, besides some medieval sculptures.

55. MEDIEVAL TEMPLE, BRAHMESHWAR, DISTRICT ALMORA.—Shri C. B. Trivedi of the Northern Circle of the Survey noticed a temple of Katyuri period of *circa* twelfth century A.D. at Brahmeshwar.

56. PREHISTORIC PAINTINGS, FORT, KALINJAR, DISTRICT BANDA.—While exploring in and around fort at Kalinjar which had been visited by Captain Pogson, Colonel Maisey and General Cunningham, Shri Krishna Kumar, Registering Officer, Varanasi region, noticed some prehistoric paintings in red ochre, depicting human and animal designs, high up on the escarpment, besides sculptures ranging in date from Gupta period to medieval times and structures, datable to medieval period.

57. MEDIEVAL SCULPTURES, ASOTHER, DISTRICT FATEHPUR.—Shri L. M. Wahal of the Northern Circle of the Survey noticed a number of stone sculptures, including Varaha, Vishnu, Uma-Mahesvara, Mahishasuramardini, Ganesa, Jaina *Tirthankaras* and *Navagraha* panel.

58. BRICK TEMPLES, SARHAN, DISTRICT FATEHPUR.—Shri L.M. Wahal of the Northern Circle of the Survey noticed two brick temples, stylistically assignable to the tenth century A.D., one of which is built of carved bricks on *tri-ratna* pattern, bearing *kudu* decorations on the exterior. The other temple, built of plain bricks and coated with a thick lime plaster, is crowned with *sikhara* of south Indian style. Both of them, however, contain images of Uma-Mahesvara and Mahishasuramardini.

59. ROCK-CUT AND OTHER SCULPTURES, MAHOBA, DISTRICT HAMIRPUR.—Shri Krishna Kumar, Registering Officer, Varanasi region, noticed: a rock-cut panel of five niches, having dancing Ganesa, Bhairava, Chamunda, seated goddess Dantura and standing Durga, probably belonging to late eleventh century A.D.; a rock-cut relief of Chamunda under elephant canopy, on the Mahoba-Laundi road; a badly-mutilated sandstone sculpture of sixty-four armed Chamunda together with some more loose sculptures and architectural members in the compound of the Sub-division Megistrate's residence; a pair of *Smarta-lingas* in the compound of a temple called Badi Chandrika; and four-armed Vishnu and two-armed Surya in sandstone in a modern shrine at Rahihilya.

60. COPPER-PLATE INSCRIPTION, JHANSI, DISTRICT JHANSI.—The Northern Circle of the Survey acquired a copper-plate inscription which was fixed in the Baragaon gate of the city wall of Jhansi. It records Shiaite charms in Arabic characters of eighteenth century A.D.

61. SCULPTURES, BAMBI, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey noticed a number of sculptures including Vishnu, Varaha, Mahishasuramardini, Uma-Mahesvara, Brahma and several architectural members.

62. SCULPTURES, BHITARGAON, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey noticed a number of sculptures including two images of Bodhisattva Maitreya holding vase of nector, belonging to Kushana period.

63. SCULPTURES, BIROHIA, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered a number of sculptures including Vishnu, Siva and Ganesa, belonging to the medieval period.

64. SCULPTURES AND TERRACOTTA FIGURINES, CHANDPUR, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered several decorated architectural members, sculptures, including Vishnu, Vamana, Kubera, Surya, Uma-Mahesvara and a *torana* in spotted red sandstone, with typical Mathura carvings, belonging to first century A.D., a massive stone head and a number of terracotta figurines, belonging to the Kushana period.

65. SCULPTURES, HATHIPUR, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered several sculptures, including Uma-Mahesvara, Vishnu, Brahma, Ganesa, Gaja, Karttikeya, *chouri-bearer, dvarapalas, simha-vyalas, Navagraha* panel, lintels and jambs.

66. SCULPTURES, KAKUPUR, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey noticed several sculptures including Surya, Vishnu, *Navagraha* panel and several architectural members.

67. SCULPTURES, MADAR RAI, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey noticed a number of sculptures including Revanta, Vishnu, Mahishasuramardini and carved pillars, belonging to medieval period.

68. SCULPTURES, MAKANPUR, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered a torso of Vamana along with many fragments of sculptures, belonging to medieval period.

69. SCULPTURES, MANADEO, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey noticed several sculptures representing Siva, Vishnu and Ganesa at Manadeo.

70. SCULPTURES, NAJAFGARH BIPOSI, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered a number of sculptures representing Parsvanatha, Surya, Vishnu, Siva, Ganesa, Gaja-Lakshmi, Ambika, *Navagraha* panel, dancing damsels, door-lintels and-jambs.

71. SCULPTURE, RADHAN, DISTRICT KANPUR.—Shri L. M. Wahal of the Survey discovered a sculpture of Mahishasuramardini.

72. SCULPTURES, RASDHAN, DISTRICT KANPUR—Shri L. M. Wahal of the Survey discovered a number of sculptures including Vishnu, Siva, Parvati and Mahishasuramardini, probably belonging to the medieval period.

73. SCULPTURES, SHEIKPUR, DISTRICT KANPUR.—Shri L- M. Wahal of the Survey dis covered architectural members and pedestal of Jaina images, belonging to the medieval period.

74. SCULPTURES, BAHLONILODH, DISTRICT LALITPUR.—Shri L. M. Wahal of the Survey noticed a number of sculptures including Uma-Mahesvara, Vishnu, Chamunda, Ganesa, *ekamukha Linga, simha-vyala,* door-jambs and lintels and Sati-pillars, belonging to the eighteenth century A.D.

75. PREHISTORIC SITE, MADANPUR, DISTRICT LALITPUR.—Sarvashri C. B. Trivedi and L. M. Wahal of the Survey discovered a site yielding Lower Palaeolithic and microlithic tools on the Madanpur hills.

76. SCULPTURES, DEHULI, DISTRICT MAINPURI.—Shri L. M. Wahal of the Survey noticed two images of Adinatha and Parsvanatha at Deuli.

WEST BENGAL

77. COPPER IMPLEMENTS, BHAKTABUNDH, DISTRICT BANKURA.—The Directorate of Archaeology, Government of West Bengal, recovered two shoulder celts and fragmentary pick-like object (coulter?) from Bhaktabundh (pl. LXIII A).

78. COPPER IMPLEMENTS, AGUIBANI, DISTRICT MIDNAPUR.—The Directorate of Archaeology, Government of West Bengal, acquired two shouldered celts (pi. LXIII B), eleven rings with pointed or blunt ends, fragmentary celt with splayed edge and discoidal lumps, initially forged as in a smithy.

79. TERRACOTTA TEMPLE-PLAQUE, DASPUR, DISTRICT MIDNAPUR.—The Asutosh Museum of Indian Art, University of Calcutta, collected a terracotta temple-plaque, depicting four hundred Vishnu figures sitting in *padmasana,* datable to *circa* eighteenth century A.D.

80. TERRACOTTA OBJECT AND PUNCH-MARKED COINS, CHANDRAKETUGARH, DISTRICT 24 PARGANAS.—The Asutosh Museum of Indian Art, University of Calcutta, collected a terracotta plaque, showing a *Yakshi* with elaborate head-gear and coiffure, displaying affinity with the Mauryan art, and a few copper punch-marked coins from the site.

81. TERRACOTTA OBJECTS AND SCULPTURES, MANDIRTALA, DISTRICT 24 PARGANAS.—The Asutosh Museum of Indian Art, University of Calcutta, collected fifteen terracotta figurines and fragments of sculptures, pottery and incised votive tablets.

V. RADIOCARBON DATES[1]

The following radiocarbon dates[2] were measured at the Physical Research Laboratory, Ahmadabad, during the year under review. The sites[3] have been arranged Statewise. The dates are in B.P. and are based on 5730 years half-life value of ^{14}C. The dates in A.D./B.G. are in parenthesis with $^{14}C/^{12}G$ variations. All the samples were given hydrochloric acid pre-treatment. Sodium hydroxide treatment wherever given has been mentioned. Rootlets wherever present were hand-picked.

ANDHRA PRADESH

1. NANDIPALLE, DISTRICT CUDDAPAH

PRL-293. Silt deposit; Shells from a clayey silt deposit; depth I'11 to 1.26 m overlying Middle Palaeolithic tool bearing gravel on the river Sagileru; sample no. Nandipalle-1. — 24360 +710 -660 (22410 B.C.)

ARUNACHAL PRADESH

2. BHALUKPUNG, DISTRICT KAMENG

(i) PRL-287. Terrace deposits; Carbonized rice from Trench no.l; locus Dezenling; layer 2; depth 0.3 to l.0 m; sample no. S/B/l. NaOH pretreatment given. — 1160±100 (A.D. 790)

(ii) PRL-288. Terrace deposit; Charcoal from Trench no. 1; locus Dezenling; layer 2; depth 0¨3 to l.0 m; sample no. S/B/2. NaOH pretreatment given. — 670±90 (A.D. 1280)

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[1]Contributed by Professor D. P. Agrawal, Shri R. V. Krishnamurthy, Kumari Sheela and Dr R. K. Pant.

"Further details of the samples can be had from the submitting organizations.

'Samples submitted by: 1, the Department of Anthropology, Andhra University, Waltair; 2, the Department of Anthropology, Dibrugarh University, Assam; 3, 6, 9, the Geological Survey of India; 4, 5, 7, the Physical Research Laboratory, Ahmadabad; 8, the Kurukshetra University, Kurukshetra; 10, 11, 13, 15, 16, the Archaeological Survey of India; 12, the Deccan College Post-graduate and Research Institute, Pune; and 14, the Department of Archaeology and Museums, Government of Rajasthan.

3. PANETHA, DISTRICT BHARUCH

PRL-145. Terrace deposit; *44.76 ± 1.01% of modern*
Pedocal with lime-caliche
From a terrace on river
Narmada overlying 2.5 m soil
Cover; sample no. GSI/NB/2
Comment: Caliche is not a reliable
Material for dating, hence expressed in
^{14}C per cent of modern

4. DUNGARPUR, DISTRICT JUNAGADH

PRL-191. Milolite deposit; 20360^{+880}_{-980} (18140 B.C.)
Miliolite from a quary
Depth 12.3 m.

5. JUNAGADH, DISTRICT JUNAGADH

PRL-263. Milolite deposit; 34730^{+5700}_{-3340} (32780 B.C.)
Miliolite from an obstacle
Dune at the base of Girnar hill.
Comment: samples dated to study inland
Miliolite formation.

6. ODADOR, DISTRICT JUNAGADH

PRL-216. Limestone deposit; 9670±150 (7720 B.C.)
Limestone from a semi-conslidated
Aeolinite deposit 8 m above
H.W.M., 1.5 km south-east of Odador;
Sample no. MM 14.
Comment: sample measured to study
Sea-level change.

7. CHOTILA, DISTRICT SURENDRANAGAR

PRL-262. Miliolite deposit; 16280^{+660}_{-610} (14330 B.C.)
Miliolite from hill slope
Near Chotila; depth 0.15 m.

HARYANA

8. MITATHAL, DISTRICT BHIWANI

(i) PRL-290. Late Siswal deposit (?); 3930 ± 140 (1980 B.C.)

Charcoal from Trench MTL-1; locus O-V; layer 17; depth 2.95 m; sample no. 10. NaOH pretreatment given. Rootlets removed.

(ii) PRL-291. Harappan culture; Charcoal from Trench MTL-1; locus XV-XX; pit sealed by layer 10; depth 2,6 m; sample no. 11. NaOH pretreatment given. — 371O±11O (1760 B.C.)

(iii) PRL-292. Harappan culture; Charcoal from Trench MTL-2; locus O-V; pit sealed by layer 4; sample no. 15. NaOH pretreatment given. — 4330±220 (2380 B.C.)

JAMMU AND KASHMIR 9.

TSO-KAR, DISTRICT LADAKH

(i) PRL-259. Lake deposit; Gastropod shells from lacustrine clay and silt deposit overlying 2 m thick sedimentary cover; sample no. SPR/1/Dating/75. — 771O±2OO (5760 B.C.)

(ii) PRL-261. Lake deposit; Carbon precipitate from lake sediments; depth 0'6m; sample no. SPR/3/Dating/75. — 4980±180 (3030 B.C.)

KARNATAKA

10. INGALADHAL, DISTRICT CHITRADURGA

PRL-252. Copper mining area; Wood from ancient mine shaft; sample no.l/75/MSC. NaOH pretreatment given. — 1730±110 (A.D. 220)

11. KALYADI, DISTRICT HASSAN

PRL-254. Copper mining area; Wood from ancient mine shaft; sample no. 3/75/MSC. NaOH pretreatment given. — 320±90 (A.D. 1630)

12. BHIMBETKA, DISTRICT RAISEN

(i) PRL-306. Cave deposit; 2900±110 (950 B.C.)
Charcoal from Trench F; locus 1 and 2; layer 1; depth 0'46 to 0.50 m; sample no. BTK/IIIF-13-1976-1. NaOH pretreatment given.

(ii) PRL-310. Cave deposit; 2390±100 (440 B.C.)
Carcoal from Trench F; locus 1 and 2; layer 2; depth 0.5 to 0-55 m; sample no. BKT/III F-13-1976-2. NaOH pretreatment given.

(iii) PRL-311. Cave deposit; 1090±90 (A.D. 860)
Charcoal from Trench F; locus 1 and 2; layer 2; depth 0'56 to 0-60 m; sample no. BTK/III F-13-1976-3. NaOH pretreatment given.

(iv) PRL-314. Cave burial; . 650± 100 (A.D. 1300)
Charcoal from Trench E; locus 2; layer 2; depth 0"61 to 0-65 m; sample no. BTK/III F-13-1976-8. NaOH pretreatment given.

.(v) PRL-315. Cave deposit; 1820±180 (A.D. 130)
Charcoal from Trench F; locus 1 and 2; layer 2; depth 061 to 0.65 m; sample no. BTK/III F-13-1976-4. NaOH pretreatment given.

(vi) PRL-316. Cave deposit; 1980±100 (30 B.C.)
Charcoal from Trench F; locus 2; layer 2; depth 0-66 to 0-70 m; sample no. BTK/III F-13-1976-5. NaOH pretreatment given.

(vii) PRL-317. Cave burial; 2570±110 (620 B.C.)
Charcoal from Trench E; locus 2; layer 2; depth 0'66 to 0-70 m; sample no. BTK/III F-13-1976-9. NaOH pretreatment given.

(viii) PRL-318. Cave deposit; 3670±110 (1720 B.C.)
Charcoal from Trench E; locus 1; layer 3; depth 071

to 0-75 m; sample no. BTK/III F-13-1976-7. NaOH pretreatment given.

(ix) PRL-321. Cave deposit; Charcoal from Trench E; locus 2; layer 3; depth 1-06 to 1-10 m; sample no. BTK/III F-13-1976-11. NaOH pretreatment given. — 390±130 (A.D. 1560)

Comment: dates show a wide scatter, attributable to recent shepherd activity.

13. BESNAGAR, DISTRICT VIDISHA

PRL-283. NBP deposit; Charcoal from Trench BSN-VI; layer 11; depth 4.1 m. NaOH pretreatment given. — 2260±140 (310 B.C.)

RAJASTHAN

14. JODHPUR, DISTRICT JAIPUR

(i) PRL-275. BRW deposit (?); Charcoal from Trench D; locus II; layer 13; depth 2-87 m; sample no. JRA 6/75. NaOH pretreatment given. — 4480± 160 (2530 B.C.)

(ii) PRL-278. OCP deposit; Charcoal from Trench D; locus II; layer sealed by 14; depth 3 m; sample no. JRA 12/75. NaOH pretreatment given. — 4180±180 (2230 B.C.)

UTTAR PRADESH

15. PIPRAHWA, DISTRICT BASTI

(i) PRL-322. Sunga-Kushana deposit; Charred rice from northwestern corner room of eastern monastery; layer 2; depth 1.65 m; sample no. 10. NaOH pretreatment given. Rootlets removed. — 2320±100 (370 B.C.)

(ii) PRL-323. Pre-Mauryan deposit; Charcoal from Room 2: eastern monastery; layer 8; depth 4'lra; sample no. 13. NaOH pretreatment given. — 2360±100 (410 B.C.)

(iii) PRL-324. Pre-Mauryan deposit; Charcoal from locus ZA2, Qdt. 3; layer 8; depth 4.2 m; sample no. 14. NaOH pretreatment given. Rootlets removed. — 2230±130 (280 B.C.)

16. MATHURA, DISTRICT MATHURA

(i) PRL-333. NBP deposit (?); Charcoal from Trench MTR-8; locus Bl, Qdt. 2; pit 3 sealed by layer 5; depth 3.18 m; sample no. 1. NaOH pretreatment given. — 2560±150 (610 B.C.)

(ii) PRL-334. NBP deposit (?); Charcoal from Trench MTR-10; locus Al, Qdt. 4; layer 9; depth 1'45 m; sample no. 3. NaOH pretreatment given. — 2680± 150 (730 B.C.)

(iii) PRL-336. NBP deposit (?); Charcoal from Trench MTR-8; locus Bl, Qdt. 2; layer 6; depth 3 m; sample no. 5. NaOH pretreatment given. — 2610±100 (660 B.C.)

(iv) PRL-337. NBP deposit; Charcoal from Trench MTR-11; locus Trial trench; pit sealed by layer 20; depth 5-45 m; sample no.6. NaOH pretreatment given. — 2410± 100 (460 B.C.)

(v) PRL-338. NBP deposit; Charcoal from Trench MTR-11; locus Trial trench; layer 18; depth 4'7m; sample no. 7. NaOH pretreatment given. — 2350±110 (400 B.C.)

(vi) PRL-339. NBP deposit; Charcoal from Trench MTR-8; locus Bl, Qdt. 3; pit 2 sealed by layer 3; sample no. 8. — 2450±100 (500 B.C.)

NaOH pretreatment given.
Rootlets removed.

(vii) PRL-340. NBP and PGW overlap; Charcoal from Trench MTR-8; locus Al, Qdt. 4; layer 11; depth 4'2m; sample no. 9. NaOH pretreatment given. Rootlets removed.	2460±150 (510 B.G.)
(viii) PRL-342. NBP and PGW overlap; Charcoal from Trench MTR-8; locus Bl, Qdt. 2; pit 8 sealed by layer 8; depth 3.65 m; sample no. 11. NaOH pretreatment given.	2250±160 (300 B.C.)
(ix) PRL-343. NBP deposit; Charcoal from Trench MTR-11; Locus Trial trench; layer 18; depth 4.2 m; sample no. 12. NaOH pretreatment given. Rootlets removed.	2220±100 (270 B.C.)

VI. PALAEOBOTANICAL AND POLLEN ANALYTICAL INVESTIGATIONS[1]

The present report incorporates the work done on the subject both at the Birbal Sahni Institute of Palaeobotany, Lucknow (below, 1-6 and 14-19), and the Deccan College Post-graduate and Research Institute, Pune (below, 7-13). Grateful thanks are due to Dr . T. T. Chang, Geneticist, International Rice Research Institute, Manila, Philippines, for kindly undertaking SEM studies of the material from Koldihwa and for intimating the results of his SEM studies of the material from Non Nok Tha.

SAMPLES FROM INDIA

ANDHRA PRADESH

1. PEDDABANKUR, DISTRICT KARIMNAGAR.—Fifteen samples of soil, belonging to different depths, were undertaken for pollen analytical investigation but none yielded any pollen remains. However, the cuticular structure of the burnt straw present in the soil samples was found to compare closely with that of *Saccharum* sp.

The preliminary examination of five samples of charcoal from this site, belonging to different depths, was also carried out prior to their processing for the preparation of blocks, etc. Samples submitted by Director of Archaeology and Museums, Andhra Pradesh.

BIHAR

2. ORIUP, DISTRICT BHAGALPUR.—Fragments of baked tiles and clay, recovered from layer 4C at site ORP II, on examination revealed burnt rice grains and husks embedded imprints of which are also seen superficially. The shape and size of these burnt rice grains compare with those of *0. sativa,* the cultivated variety. The rice grains and chaff were mixed with clay before modelling tiles and clay pieces.

Samples submitted by the Director of Archaeology and Museums, Bihar.

3. SONPUR, DISTRICT GAYA.—Carbonized grains of rice, recovered from the site, compare on morphological grounds, with those of *0. sativa.*

Sample submitted by the Director of Archaeology and Museums, Bihar.

4. BARUDIH, DISTRICT SINGHBHUM.—Carbonized grains of rice in large quantity, found mixed with clay, and impressions and compressions of rice grains and husks on clay and brick pieces, recovered from the site, on morphological characters seem to belong to the cultivated variety of *0. sativa.*

Sample submitted by the Director of Archaeology and Museums, Bihar.

GUJARAT

5. PRABHAS PATAN, DISTRICT JUNAGADH.—Sizable quantity of carbonized seeds, recovered from the site, were identified as of *Phaseolus vulgaris* (common beans).

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

Contributed by Dr Vishnu Mittre and Kumari R. Savithri, and Shri M. D. Kajale.

HARYANA

6. DAULATPUR, DISTRICT KURUKSHETRA.—Charred grains, from the late Harappan level from locus 01, layer 5, depth 1.65 m, have been identified as of *Phaseolus mungo (Urd).*

Carbonized lumps from the same site, but belonging to the third-fourth century A.D., have been identified as that of cultivated rice, *0. sativa.*

Sample submitted by Professor U. V. Singh, Department of Ancient Indian History, Archaeology and Culture. University of Kurukshetra.

MAHARASHTRA

7. NEVASA, DISTRICT AHMEDNAGAR.—A rich plant economy including *Paspalum scrobiculatum, Pennisetum typhoides,* oil seeds *Carhhamus tinctorius* and seeds of *Coriandrum sativum* have been identified among the charred grains from the deposit belonging to the early historical level.

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

8. BHOKARDAN, DISTRICT AURANGABAD.—A rich plant economy including wheat, rice, *ragi, jower, Cajanus cajan, lentil, Cicer arietinum, Lathyrus sativus, Dolichos lablab, Phaseolus mungo, Pisum arvense* and *Zizyphus jujuba* has been identified from the grain remains belonging to the Satavahana level.

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

9. KAUSAN, DISTRICT AURANGABAD.—A Satavahana site on the right bank of the river Godavari has yielded impressions and casts of grains of Great Millet *(Sorghum* sp.) on bricks.

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

10. MUNGI, DISTRICT AURANGABAD.—An early historical site on the right bank of the river Godavari has yielded charred grains of wheat *(triticum* sp.), rice *(Oryza sativa* Linn.), Pearl Millet or *Bajra (Pennisetum typhoides* Stapf. and Hubbard), Great Millet or *Jower (Sorghum vulgare* Pers.), Common pea *(Pisum arvense* Linn.), Bengal Gram *(Cicer arietinum* Linn.), Pigeon Pea or *Urhar (Cajanus cajan* Millsp.), and Safflower *(Carthamus tinctorius* Linn.).

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

11. PAITHAN, DISTRICT AURANGABAD.—A Satavahana site on the left bank of the river Godavari has yielded dehusked charred grains of Kodon-Millet *(Paspalum scrobiculatum* Linn.).

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

12. NAVDATOLI AND MAIIESHWAR, DISTRICT NIMAD.—The re-examination of archaeobotanical plant remains of the site has yielded barley, in addition to the ones noticed earlier (Sankalia, H.D., 1974, *Prehistory and Protohistory in India and Pakistan,* p. 460 and Vishnu-Mittre, 1962, *Technical Report on Archaeobotanical Remains, Pune.)*

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

13. TER, DISTRICT OSMANABAD.—The re-examination of the plant remains, belonging to late Satavahana period, has yielded rice, wheat, *Phaseolus* and *Zjzyphus jujuba,* in addition to fairly rich plant economy belonging to Satavahana to post-Satavahana period (150 B.C. to A.D.'260) reported earlier (Vishnu Mittre, U. Prakash and N. Awasthi, 1972, *Geophytology,*

Sample submitted by the Deccan College Post-graduate and Research Institute, Pune.

TAMIL NADU

14. APPUKALLU, DISTRICT NORTH ARCOT.—The soil samples belonging to the late neolithic and early Iron Age (100 B.C. to A.D. 300), between locus I-II, from layers 13 and 14, from a depth of 4-15 m and 4.32 m below surface respectively were found devoid of any pollen. However, the charcoal samples APKL-1, from locus 0-0 and III-IV, layers 12 and 9, from a depth 3-85 to 4·20 m below surface respectively, belonging to the beginning of the Christian era and third-fourth century A.D., contain some fragments, the larger ones among which are being processed for detailed study.

Sample submitted by Professor K. V. Raman, Department of Ancient Indian History, Archaeology and Culture, University of Madras.

UTTAR PRADESH

15. KOLDIHWA, DISTRICT ALLAHABAD.-—The recent Scanning Electron Micrographic studies of the impressions and compressions of rice on potsherds from Koldihwa, conducted by Professor T. T. Chang at the International Rice Research Institute, Manila, Philippines, have confirmed the identity of cultivated strain of rice reported earlier *(1975-76,* p. 88).

Sample submitted by Professor G. R. Sharma of the Department of Ancient History, Culture and Archaeology, University of Allahabad.

16. MANWAN DIH, DISTRICT SITAPUR.—Carbonized kernels of rice from this site compare very closely with those of *0. sativa,* the cultivated variety.

Sample submitted by the Director of Archaeology and Museums, Uttar Pradesh.

SAMPLES FROM ABROAD

AFGHANISTAN

17. GHARULI, FARYAB.—Remains of cotton belonging to *Gossypium* comprising textiles and cotton balls from Trench I, cut 2e 100, have been undertaken for study. The materials have been dated at the Birbal Sahni Institute of Palaeobotany to 340±110 years B.P.

Sample submitted by Professor Louis Dupree, American Museum of Natural History, New York.

NEPAL

18. LUMBINI.—Several charcoal samples, some too fragmentary for further studies, seem to be derived from one plant species, on preliminary examination. However, the pieces of vase, probably used for cooking, on examination, revealed impressions of rice grains and husks. The size, shape and other morphological features of these impressions compare with that of the cultivated variety of rice, *0. sativa*. It is apparent that the ancient Indian practice of mixing rice spikelets and husk as binding material with clay for making pottery was also prevalent in ancient Nepal.

Sample submitted by the Director of Archaeological Survey, His Majesty's Government, Nepal.

THAILAND

19. NON NOK THA.—The rice imprints from the neolithic level, referred to as hybrid between wild and cultivated rices, was found on Scanning Electron Micrographic studies by Professor T. T. Chang of International Rice Research Institute, as wild strain of rice.

VII. MUSEUMS

1. TAJ MUSEUM, AGRA.—The work of organizing the Museum is in progress. Structural repairs to the building have been completed, and the work of electrification is in progress.

2. ALLAHABAD MUSEUM, ALLAHABAD.—During the year under review, the Museum acquired, from Shri Sita Ram Upadhya of Buxer, eighty terracotta figurines, including a number of heads with exquisite and elaborate head-gears and a rare *Yaksha* figure with bulged out belly. The Stone Sculpture galleries were reorganized and sixteen more sculptures were put on display in the medieval gallery. Seventy terracotta figurines belonging to Sunga period were also displayed in new showcases.

3. AMRITSAR MUSEUM, AMRITSAR.—The Museum is being organized in Maharaja Ranjit Singh's Summer Palace. A large number of ancient armoury and weapons have been shifted from the collection of the Patiala Museum along with the paintings of the Lahore Darbar. Oil paintings have been displayed on the screens in the Darbar Hall. Forty-four showcases for the display of the armoury were prepared. Structural conservation of the building is also in progress.

4. GOVERNMENT MUSEUM, BANGALORE.—The Museum organized visual education programme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic reproductions of antiquities, leather puppets, paintings and specimens of arts and crafts.

5. SRI VENKATAPPA'S ART GALLERY, BANGALORE.—As a part of visual education programme the Museum organized screening of documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides arranging exhibitions of photographic reproductions of antiquities, leather puppets, paintings and specimens of arts and crafts.

6. GOVERNMENT MUSEUM, BASAVAKALYAN.—This Museum also organized visual education programme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., and organized exhibitions of photographic reproductions of antiquities, leather puppets, paintings and specimens of arts and crafts.

7. ORISSA STATE MUSEUM, BHUBANESWAR.—During the year under review, the Museum acquired sculptures, decorative architectural members of the temples, monolithic cisterns from the old palace at Puri, a copper-plate, belonging to the Sultanate of Golconda from Rourkela in District Sundargarh, and a set of three copper-plate grants of Ranabhanjadeva from Koukala in District Phulbani, two Persian silver coins, and anthropological objects like old brass scale of different weights, etc., and several estampages of inscriptions.

Reorganization of the Prehistory Gallery is in progress. The garden around the Museum was improved.

8. ARCHAEOLOGICAL MUSEUM, BIJAPUR.—Reorganization of the Museum is in progress. The flooring of the galleries on the ground floor was relaid with glazed Shahabad slabs. Electrical wiring of all the galleries and the *dalans* was completed.

9. ARCHAEOLOGICAL MUSEUM, BODHGAYA.—The main gallery of this Museum was reorganized. Eight pillars of the Sunga period were displayed between the Sunga and Pala

sculptures in the main hall. The galleries and the outer walls of the Museum were painted in suitable shades.

10. PRINCE OF WALES MUSEUM, BOMBAY.—The work in new Gallery of Indian Pre-and Protohistoric periods, set up with the assistance of the Deccan College Post-graduate and Research Institute, Pune, having sections on Stone Ages, Harappan Culture, Megahthic Culture with a separate wing displaying sculptures from Assyria, Persepolis and Egypt, is nearing completion.

At the instance of the Survey sixteen stone sculptures, two terracotta tiles and eight hundred and thirty coins, were handed over to us by the disposal unit of the Collector of Customs, Bombay, being seized antiquities. In addition, the Museum acquired thirteen stone sculptures, including Ganesa (6 X 5 cm) in red sandstone from Mathura, belonging to second century A.D., two Caryatid (35·5 X 34.5 and 21.5 X 15.5 cm) in sandstone from Madhya Pradesh, datable to seventh-eighth century A.D., a female torso (ht. 21.5 cm) and a Caryatid (ht. 24.5 cm), both in sandstone from Madhya Pradesh, belonging to *circa* ninth century A.D., and Vishnu (pl. LXIV A) in granite of Chola period from south India, datable to the twelfth century A.D.; bronzes such as two Osiris (ht. 9.3 and 11 cm) from Egypt belonging to *circa* third-second century B.C., and Kaliya Krishna from south India, belonging to seventeenth century A.D.; and one hundred and five terracotta figurines, including male, female and animal figurines, ranging in date from second-first century B.C. to eighteenth-ninteenth century A.D.

11. ASUTOSH MUSEUM OF INDIAN ART, CALCUTTA.—During the year under review, the Museum acquired nearly one hundred objects of stone, metal, terracotta, ivory and coins, paintings and folk art objects. The stone sculptures include a seated *Tirthankara* under a canopy of snake hood, a seated Varahi in *lalitasana* on a bull, a two-handed Bhairava, all datable between *circa* twelfth and fifteenth century A.D. The ivory figures of Christ of late ninteenth century and dices from Goa, Mughal and Rajasthani miniatures, scroll-paintings of Bengal and Orissa, leather playing cards from Vishnupur, having traditional and auspicious painted motifs and painted wooden panels from Orissa, are the other noteworthy acquisitions.

12. INDIAN MUSEUM, CALCUTTA.—The Museum acquired five hundred and three silver coins of Indo-British period and illuminated manuscript of *Khiradnama Sikandari* (pl. LXV), copied by the well known calligraphist Mir 'Ali, from the works of A. R. Jami, an eminent Persian poet of the sixteenth century.

13. WEST BENGAL STATE ARCHAEOLOGICAL GALLERY, CALCUTTA.—During the year under review, the Museum acquired through gift from Dr Zainal Abedin twelve sculptures datable from ninth to eleventh century, including a *rishi* and Vishnu from Chhatraghati in District West Dinajpur and Surya, Durga, Mahishasuramardini, Manasa, Uma-Mahesvara, Sadyojata, *Navagraha* and *rishi,* all from Tungi Shahar in District Malda. Besides, the Museum acquired sculptures including Mahishasuramardini, *Navagraha* panel and a rare dancing Bhairava, datable from tenth to eleventh century, from Gunirajpur in District West Dinajpur, two of Vishnu and one of Karttikeya, flanked by Devasena and Valli and pedestal bearing an inscription in proto-Bengali characters from north Bengal and datable to *circa* twelfth century, Indra on elephant(?) from Harmashra in District Bankura, a large torso of a *Tirthankara,* belonging to *circa* tenth century and a fragmentary Jaina sculpture belonging to seventh-eighth century found at Sat-Deulia in District Burdwan.

14. BHURI SINGH MUSEUM, CHAMBA.—During the year under review, the Museum acquired one hundred and two art objects and antiquities.

15. LOCAL ANTIQUITIES MUSEUM, CHITRADURGA.—The Museum had visual education programme organized by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic enlargements of antiquities, leather puppets, paintings and specimens of arts and crafts.

16. CHANDRADHARI MUSEUM, DARBHANGA.—Some of the galleries of the Museum were re-arranged and the Rajnagar Bronzes Gallery was provided with new showcases. A special exhibition was arranged with paintings and handicrafts by school-going children in the Museum Week.

17. ASSAM STATE MUSEUM, GAUHATI.—During the year under review, the Museum acquired eight cannon of Ahom period.

18. GAYA MUSEUM, GAYA.—The Museum acquired : two bronze images, one of Vishnu (pl. LXIV B) belonging to the twelfth century A.D., from Wazirganj in District Gaya, and the other of Varaha with three miniature figures of the same animal on either side of the main figure (pl. LXIV C), belonging to Pala period, from Bhelawar in District Bhelawar; door-jambs, Uma-Mahesvara and Surya from Jangambari in District Gaya; twenty-seven copper coins of which one is uninscribed cast coin, three of Kanishka, fourteen of Sharqui kings, one of Mahamood Shah Khalji II and rest of native states; two stone sculptures of Manjusri of Pala period; two guns; and one javelin of eighteenth century.

19. DISTRICT MUSEUM, GULBARGA.—The Museum organized educational programme by screening documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic reproductions of antiquities, leather puppets, paintings and other specimens of arts and crafts.

20. ARCHAEOLOGICAL MUSEUM, HALEBID.—Mending and erection of *prabhavali* of the recently-repaired colossal Adinatha *Tirthankara* figure, of about 5".70 m height, in the Museum was completed. Under the National Service Scheme, the Museum participated in an exhibition at Hassan organized by the Mid-southern Circle of the Survey by exhibiting selected sculptures and wood carvings.

21. ARCHAEOLOGICAL MUSEUM, HAMPI.—The reorganized Museum in the new building was thrown open to the public on the 2nd October, 1976. In the new galleries, sculptural and architectural pieces of the Vijayanagara period, collected from the area, were also displayed (pl. LXVI A). A model, giving a panoramic view of the area with monuments made to scale, was exhibited. The main entrance to the Museum has been modelled on the pattern of Vijayanagara temple gateway, the pillars being cement replicas of the originals. Informative labels both in English and Kannada have been provided to the exhibits for the convenience of the visitors.

22. ORISSA STATE MUSEUM, KHARIAR.—This Museum, housing palm-leaf manuscripts, sculptures, terracotta beads, coins, copper-plates, old pottery, swords, *tantric* and totemic objects, was opened for public on 21.10.1976.

23. KITTUR RANI CHANNAMMA MEMORIAL GOVERNMENT MUSEUM, KITTUR.—The Museum organized visual education programme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic enlargements of antiquities, leather puppets, paintings and specimens of arts and crafts.

24. ARCHAEOLOGICAL MUSEUM, KONARAK.—Under the National Service Scheme, the Museum organized a series of exhibitions, accompanied by seminars, film shows, illustrated lectures, etc., in which the officials of the Survey and lecturers and students of the University and colleges participated.

25 STATE MUSEUM, LUCKNOW.—The walls of the galleries of the Archaeological Section were colour-washed to provide a suitable background for the exhibited sculptures. On the occasion of 2600th birthday celebration of Lord Buddha, an exhibition was set up, showing chronologically the evolution of Buddha and the Bodhisattva figures from early centuries down *to area* twelfth century A.D. A seminar was also organized on the occasion on 27 and 28 February. 1977 on the Buddhist Art.

During the year under review, the Museum acquired a votive tank (22 X 20 cm) of Kushana period, Gajalakshmi in red sandstone (16x12 cm) of Gupta period, thirty paintings and sketches, six metal images, a relic-casket of Shri Chandra Shekhar Azad, one yellow jade pipe oi *hukka*; eight copper coins, twenty-three silver coins and one billion coin.

26 FORT SAINT GEORGE MUSEUM, MADRAS.—P.V.C. wall-paper has been used to cover the walls as an experimental measure in the Indo-French Gallery in the Museum. Reorganiza tion of the two galleries, exhibiting arms, armour, uniforms, etc., was completed. The guilded frames of the paintings in the Portrait Gallery were renovated.

Under the National Service Scheme, the Museum organized a series of exhibitions accompanied by seminars, film shows, illustrated lectures, etc., in which the officials of the Survey and lecturers and students of the local University and colleges participated.

27. SHREEMANTHI BAI MEMORIAL GOVERNMENT MUSEUM, MANGALORE —The Museum organized visual education programme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic reproductions of antiquities, leather puppets, paintings and specimens of arts and crafts.

28. GOVERNMENT MUSEUM, MATHURA.- The noteworthy antiquities acquired by the Museum include: a stone umbrella (1.11 X 1.05 m) showing eight auspicious motifs and lotus, which might have served as roof of a miniature shrine, in red sandstone, belonging to Kushana period from Padam Nathji temple, Mathura; seated Buddha in *abhayamudra* (1.15 X 0.83 m) from Govindnagar in Mathura city, in red sandstone, belonging to Kushana period; standing Buddha in *abhyamudra* in red sandstone, from Govindnagar (1.47 X 0.52 m) wearing a transparent drapery with rippling folds, bearing an inscription on the pedestal informing that it was installed in Gupta era 115 (A.D. 434) in the reign of Kumaragupta Mahendraditya and the name of the artist as Dinna; another standing Buddha in buff sandstone (0.77 X 0.35 m), in *abhayamudra*, wearing a foldless drapery, datable to the early Gupta period, from Govindnagar; pedestal of the Buddha image (28 X 47 cm) in red sandstone, from Govindnagar, bearing an inscription the Buddha image (28 X 47 cm) in red sandstone, from Govindnagar, bearing an inscription in four lines recording the name of the monastery as Viradatta-vihara and dated in Gupta era 121 (A.D. 440); fragment of a pillar (ht. 70 cm) in red sandstone from Govindnagar, with inscription, recording twelfth regnal year of *Maharaja Dao Puttra Kanishka*; railing pillar (ht. 63 cm) in red and buff sandstone from Govindnagar, with a noble man holding a garland, belonging to Kushana period; a railing pillar with royal devotee (ht. 1.10 m), in red sandstone from Govindnagar belonging to Kushana period; out of two rail-posts, one (ht. 1.39 m) carved with four compartments showing worship of Bodhisattva turban and *rishi* Sringa episode and the other (ht. 1.08 m) representing a woman seated ton a wicker seat looking into the mirror, in red sandstone, from Govindnagar, datable to first century B.C.; a door-jamb, carved with

creepers, fish, crocidile and human figures in Indo-Seythian style, in red sandstone (ht. 78 cm), from Govindnagar; a panel in red sandstone (14 X 11 cm), carved with the scene of renunciation of Gautam, from Govindnagar, Besides, the Museum was enriched by the addition of some early terracotta, a hoard of late Kushana period coins and few bronzes of ninteenth century.

The Museum, during the year under review, organized several lectures on Indian Art, history, culture and archaeology by noted scholars in the field, besides arranging temporary exhibitions of new finds on different occasions.

29. GOVERNMENT MUSEUM, MERCARA.- The Museum conducted visual education programme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., and organized photographic exhibitions.

30. CENTRAL MUSEUM, NAGPUR.—During the year under review, the Museum received two copper-plate grants from Malhara in District Amaravati and the other one from Kamthi in District Nagpur. The Malhara copper-plate belongs to Adityaraja and the other one is of Vakataka king Pravarasena II, issued in the nineteenth regnal year of his reign. Besides, five silver coins of Mughal period were also received.

The Museum organized an exhibition of excavated material from Mandhal along with the antiquities from Piprahwa.

31. ARCHAEOLOGICAL MUSEUM, NALANDA.—An imposing twelve-armed standing Avalokitesvara, attended by Tara and Bhrukuti at the bottom, Prajnaparamita and Vasudhara on either side and with Suchimukha and Hayagriva, datable to ninth century A.D. is the new attraction in the main gallery of the Museum. The Bronze Gallery of this Museum was repainted. A modern bronze *stupa,* depicting the events of Buddha's life, gifted to the Survey in 1956 by Pandit Jawaharlal Nehru, was mounted on a wooden pedestal and exhibited in the main hall.

Under the National Service Scheme, the Museum organized a series of exhibitions, accompanied by seminars, film shows, illustrated lectures, etc., in which the officials of the Survey and lecturers and students of the University and colleges participated.

32. NATIONAL MUSEUM, NEW DELHI.—The Museum acquired, through purchase and gifts, several sculptures, bronzes and terracottas. Noteworthy among the sculptures received as gift are a bust of Siva or Nataraja (pl. LXVII A) and *dvarapala* (pl. LXVIII A) from Nachna-Kuthar, datable to the Gupta period (fifth century A.D.), presented by Shrimati Pupul Jayakar, New Delhi; *ekamukha Siva-linga,* belonging to Gupta period (fifth century A.D.), Harihara (pl. LXVIII B) and Vardhana of seventh century A.D. from Madhya Pradesh, presented by Shri C. K. Kejriwala, New Delhi. Important among the bronzes are Nataraja from south India and Indra from Nepal, both datable to *circa* fifteenth century A.D. Interesting among the terra cotta objects is a toy-cart (pl. LXVII B) of the Sunga period (second century B.C.), from Kausambi, showing the bust of a female in the front.

33. PATNA MUSEUM, PATNA.—The Museum, during the year under review acquired a number of antiquities noteworthy amongst which were: three images of Vishnu, three of Kamadeva with Rati and Trisha, a dancing Siva, Uma-Mahesvara, etc., belonging to Pala period, from Dabthu in District Gaya; a colossal image of Vishnu (2.63 X 1.40 m) of Pala period from Nawdiha in District Gaya; five debased gold coins of Srimad Chandra Deva of Gaharwar dynasty, from Chausa in District Bhojpur; one circular gold coin of Huvishka from Katragarh in District Muzaffarpur; two silver coins, probably of Vigrahpala, from Shankarpur in District Saharsa; and a mutilated image of Surya. Besides, the Museum received as gift from Shrimati

Satyabhama Jalan six hundred and seven terracotta objects, datable from Mauryan to Gupta times; one hundred and seven stone sculptures including Buddha, Ashtamatrikas, Navagraha and Revanta, mostly belonging to Pala period; and eight iron objects of late medieval times.

34. ARCHAEOLOGICAL MUSEUM, SANCHI.—A map showing the location of Mauryan pillars was hung near the Asokan Capital in the main gallery for the information of the visitors.

Under the National Service Scheme, the Museum organized a series of exhibitions accompanied by seminars, film shows, illustrated lectures, etc., in which the officials of the Survey and lecturers and students of the University and colleges participated.

35. ARCHAEOLOGICAL MUSEUM, SARNATH.—The ceiling of all the galleries were painted in off-white colour for reflecting natural light on the exhibits. All the galleries have been provided with cushioned benches for the visitors. The work of providing exhaust fans to all the galleries is in progress.

36. GOVERNMENT MUSEUM, SHIMOGA.—The Museum organized visual education pro gramme by showing documentary films on art, culture, monuments, antiquities and lives of artists, poets, etc., besides organizing exhibitions of photographic reproductions of antiquities, leather puppets, paintings and specimens of arts and crafts.

37. STATE MUSEUM, SIMLA.—During the year under review, the Museum acquired one thousand four hundred and seven objects, through purchase, exploration, gifts or transfer, including coins, miniature paintings of different Indian schools, stone sculptures from District Kulu, bronzes and prehistoric stone tools from the Markandeya valley in District Sirmur.

38. TIPU SULTAN MUSEUM, SRIRANGAPATNA.—The personal articles of Tipu Sultan, such as coat, *pyjama,* sword, guns and a small portrait in oil, have been exhibited in a special room named after him.

39. MUSEUM AND PICTURE GALLERY, VADODARA.—Under the reorganization work, half portion of the Archaeological Section was converted into Gallery of Sculptures of Gujarat, in which sculptures of Samlaji and Roda, bronzes of Akota and Lilvadeva-Mahudi are displayed. A series of mounted photographs of ancient monuments and sculptures of Gujarat and other parts of India are exhibited on the top of the showcases, one of the ancient coins of the West and the other of coins of modern world, were added to the Numismatics Section.

The Museum acquired: one oblong axe-blade and two hollow silver bangles from Rozadi in Saurashtra, as a loan from the Department of Archaeology, Gujarat State; two Saivite deities (pl. LXIX A), one presented by the Survey; and five bronze images, including a tribal deity, (head of Siva probably in the form of *linga* and Mahishasuramardini), belonging to fourtheenth-fifteenth century A.D. An illustrated manuscript of *Durga Sapta Sati* of *circa* eighteenth century A.D. was also added to the collection of manuscripts of western Indian origin.

40. ARCHAEOLOGICAL MUSEUM, VAISHALI.—The Museum acquired, through purchase, one hundred and eighty-seven terracotta figurines, representing human (pl. LXIX B) and animal motifs, datable from Mauryan to medieval period. Chronological display of pottery was done in a bracket showcase; and two new showcases, exhibiting seals, sealings, terracotta toys, mouldings, etc., of different periods, a medieval Buddha head and ornamental bricks of Gupta period were also added. Thus, the display of one gallery was completed in all respects and thrown open to the public (pl. LXVI B).

41. BHARAT KALA BHAVAN, VARANASI.—During the year under review, the Museum acquired eight hundred and sixty coins, including silver and copper punch-marked coins, copper cast coins, gold coins of Akbar and Tughlaq, silver coins of Shahjahan, Aurangzeb, Muhammad Shah, Shah Alam Bahadur, Victoria and George V and billion coins of Alauddin and Mubarak Shah of Khalji dynasty. Besides, four hundred and seventy-six objects of archaeological importance, including stone sculptures and beads, terracotta figurines and seals, bronze images, wooden and ivory figures, copper-plate and metal objects were also added to the collection. Noteworthy among them are: a dish, depicting Surya of Gandhara school, belonging to *circa* fourth century A.D.; sculpture of *lingodbhava* Siva with Brahma from Kashmir, belonging to *circa* fourth century A.D.; terracotta plaque, showing Vasudeva of Sunga period; Lakshmi in terracotta with *chauri*-bearers of Sunga period; three Chamba brass masks; standing Parsvanatha in bronze, datable to *circa* ninth century A.D. ; a copper-plate of *Maharajadhiraja* Shri Raja Baj Bahadur Chandra Deva; and Gajendramoksha figure in ivory, datable to eighteenth century A.D.

. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

CENTRAL CIRCLE

Madhya Pradesh

1. MAMABHANJA TEMPLE, BARSOOR, DISTRICT BASTAR.—Flooring of the temple was paved with stones, and doors were provided to the entrance. Joints in the stone masonry of the temple-walls were pointed.

2. NARAYANPAL TEMPLE, NARAYANPAL, DISTRICT BASTAR.—Flooring was provided with flag-stones and the open joints in the masonry were pointed.

3. MAHADEO TEMPLE, PALI, DISTRICT BILASPUR.—Accretionary cement plaster was removed from the door frame, and the cracks were grouted with liquid cement mortar.

4. RANGMAHAL PALACE, HATTA, DISTRICT DAMOH.—Debris inside the room was removed to expose the original flooring. Walls were restored and watertightened. Tops of the walls were pointed.

5. BUDDHIST CAVES, BAGH, DISTRICT DHAR.—All the four disintegrated pillars in Cave 1 were carefully removed and replaced by R.C.C. ones as per the original. All the hollows and cavities in the side-walls were filled with cement concrete. Debris inside Cave 1A was removed. In Cave 2, damaged sculptures of Buddha and attendants in the south-eastern corner were repaired as per the original with cement concrete. The portico between the central door of Cave 4 and the window of Cave 5 was restored with a view to preserving the paintings on the facade of Caves 4 and 5.

6. DILAWAR KHAN'S MOSQUE, MANDU, DISTRICT DIIAR.—Flag-stone flooring of the mosque was relaid.

7. GADA SHAH'S PALACE, MANDU, DISTRICT DHAR.—Debris was removed to expose the original flooring of the platform, and necessary repairs were carried out to the walls of the monuments.

8. HAMMAM, MANDU, DISTRICT DHAR.—Debris was .removed from the rooms to expose the original flooring, and the walls were restored, wherever necessary, and watertightened.

9. HATHI POLE, MANDU, DISTRICT DHAR.—Walls of the gate were restored to original height, wherever necessary, and cracks in the masonry were suitably grouted.

10. JAHAZ-MAHAL, MANDU, DISTRICT DHAR.—Walls of the monument were plastered, wherever necessary, while the old plaster was edged, and were watertightened.

11. KAPUR TALAO AND RUINS, MANDU, DISTRICT DHAR.—Original flooring was exposed and the walls of the ruins around the tank were repaired.

12. MALIK MUGHITH'S MOSQUE, MANDU, DISTRICT DHAR.—The damaged flooring of the mosque was repaired by relaying with red sandstone slabs.

13 SIVA TEMPLE, DEOBALODA, DISTRICT DURG.—Dead lime concrete of the *mandapa root* was removed, and the walls of cut stone masonry, set in lime concrete, were restored, pointed and plastered.

14. FORT, ASIRGARH, DISTRICT EAST NIMAR.-Vegetation growth on the walls of the fort was removed, and the approach road from Asirgarh to Jami mosque was laid with rubble.

15. IDGAH, ASIRGARH, DISTRICT EAST NIMAR.-The platform of the Idgah was repaired, and flag-stones of the flooring were freshly laid.

16. MAHADEO TEMPLE, ASIRGARH, DISTRICT EAST NIMAR.—Broken stones of the flooring were replaced with new ones.

17. AHUKHANA, BURHANPUR, DISTRICT EAST NIMAR.-Debris of the collapsed walls was removed, and the walls were restored.

18. BIBI SAHIB'S MASJID, BURHANPUR, DISTRICT EAST NIMAR.-Original floor level of the mosque was exposed by removing debris, and a fresh flooring was provided.

19 RATA'S CHHATRI NEAR BORDHA GHAT, BURHANPUR, DISTRICT EAST NIMAR.—Broken and missing stones of t1ie *chhajja* were replaced with new ones and new flag-stones were provided for the flooring.

20. PALACE IN FORT, BURHANPUR, DISTRICT EAST NIMAR.-Walls were reconstructed, wherever necessary, in uncoursed masonry.

21 TOMB OF SHAH NAWAZ KHAN, BURHANPUR, DISTRICT EAST NIMAR.-Decayed concrete of the flooring was removed and relaid with fresh cement concrete.

22 BADA MADARSA, CHANDERI, DISTRICT GUNA.-A compound-wall around the monument was constructed with a view to stopping encroachment.

23. JAMA MASJID, CHANDERI, DISTRICT GUNA.-Damaged flooring was removed and relaid with new flag-stones.

24 TOMB OF NIZAM-UD-DIN'S FAMILY, CHANDERI, DISTRICT GUNA.-The original flooring of the tomb was exposed after removing the debris.

25 CHATURBHUJA TEMPLE, FORT, GWALIOR, DISTRICT GWALIOR.-Decayed lime concerete of the flooring of the verandah and platform was removed, and fresh flooring was provided.

26 ROCK-CUT JAINA COLOSSI (MARIMATA),GWALIOR, DISTRICT GWALIOR.-Incontinuation of the last yearns work, construction of the compound wall m course rubble masonry was completed.

27. TOMB OF MOHAMMAD GHAUS, GWALIOR, DISTRICT GWALIOR.-Repairs to the graves including pointing was carried out.

28. CHAUSATH-YOGINI TEMPLE, BHERAGHAT, DISTRICT GWALIOR.—Moss and lichen growth over the walls were cleaned. Decayed plaster on the walls was removed and the joints in the masonry were pointed.

29. GAURI-SHANKAR TEMPLE, BHERAGHAT, DISTRICT JABALPUR.—Cracks in the *sikhara* were grouted with liquid cement mortar. The area around the *chhatri* was plastered with cement. The flooring of the temple was repaired with new slab stones and the joints were pointed.

30. TEMPLE AT TIGWAN, DISTRICT JABALPUR.—The area around the temple was fenced with barbed wire.

31. BUDDHIST CAVES, DHAMNAR, DISTRICT MANDASOR.—The terrace of the roof of the northern side of rock-cut Suraj Pole and the northern side of the caves were restored with cement concrete, as per the original.

32. GADHI, PADHAVLI, DISTRICT MORENA.—The original flooring was exposed by removing debris.

33. NACHNA KUTHAR PARVATI TEMPLE, NACHNA, DISTRICT PANNA.—The decayed and broken slabs of the roof were replaced with new ones, and lime concrete terrace was provided.

34. RAMCHANDRA TEMPLE, RAJIM, DISTRICT RAIPUR.—The disintegrated terrace was removed and relaid. Pointing was done to the joints in the stone work of the temple.

35. SIVA TEMPLE, BHOJPUR, DISTRICT RAISEN.—The bulged and damaged stone masonry of the platform was dismantled and reconstructed as per the original.

36. ANCIENT MONUMENTS, SANCHI, DISTRICT RAISEN.—Stone pitching was provided for the southern and northern approaches to Monastery 51 and all approaches to the monuments and Archaeological Museum were suitably repaired. Four of the small square *stupas,* which were badly damaged, were dismantled and reconstructed in cement mortar as per original. Stone slab pavement was provided on the northern side of the *Stupa* 1. Loose and dislodged portion of the masonry of *Stupa* 5 was dismantled and reconstructed as per the original and thereafter watertightened. Cracked and damaged portions of the wall of the Temple 46 were dismantled for reconstructing as per the original. Other parts of the walls were watertightened. Stone slab pavement was provided to the cells of the temple. The damaged flooring of Temple 47 was removed and relaid with new stones. Joints were pointed with cement mortar.

37. GADHI, SURWAYA, DISTRICT SHIVPURI.—Debris was removed for exposing the original plan of the monument and the damaged parts were watertightened.

38. CAVES, UDAYAGIRI, DISTRICT VIDISHA.—Doors were provided to the entrances of all important caves. R.C.C. slab was provided to the portico of Caves 5 and 6.

DELHI CIRCLE

Delhi

39. DELHI GATE, DELHI.- Roof of the Gate was concreted and the masonry joints of the façade were pointed.

40. KASHMIRE GATE, DELHI.—Loose joints of the brick masonry of the facade were pointed and cells flanking the gate were reconditioned. Joints in the fortification-wall between Kashmire gate and Mori gate were also pointed.

41. RED FORT, DELHI.—Damaged drains of the Nahr-i-Hayat were reconditioned by concreting the surface. The tank in front of Rang Mahal was exposed to the original floor-level. The full length of the boundary-wall of the Sunehri Masjid was restored.

42. ROSHANARA BARADARI, DELHI.—Fallen structures of *lakhauri* bricks were reconstructed, and loose and dead plaster on the walls was removed and surface was replastered. The roof was reconcreted.

43. TALAQI GATE, DELHI.—Cracks in the masonry wall were grouted and loose joints were pointed. Cracks in the roof were also plugged.

44. TRIPOLIA GATE, DELHI.—Loose joints in the walls of the gate were pointed.

45. AFSARWALA TOMB, NEW DELHI.—Fallen boundary wall was reconstructed to enclose the area.

46. HUMAYUN'S TOMB, NEW DELHI.—Dead and spongy concrete of the terrace was removed and reconcreted.

47. JANTAR MANTAR, NEW DELHI.—Pathways, laid in red sandstone slabs, were provided.

48. KHAN-I-KHANAN TOMB, NEW DELHI.—Joints in the rubble masonry of the plinth were pointed; the work of restoring the fallen *chhatris* is in progress.

49. KHUNI DARWAZA, NEW DELHI.—Roof of the gate was concreted and the monument was given a face-lift.

50. KOTLA FIROZ SHAH, NEW DELHI.—Dilapidated portions of the north-western bastion and the fortification-wall were restored as per the original. Joints in the walls were raked and pointed. Arrow slits and hooded machicolations were replaced with new ones.

51. LAL KOT, NEW DELHI.—The old buried structure of the fort in the south-western side was exposed; the work of raising the height of the fortification-wall as per the original is in progress.

52. PURANA QILA, NEW DELHI.—The eastern fortification-wall was repaired by pointing the loose joints of the masonry. The cells were also reconditioned by plastering, pointing and concreting.

53. QUTB MINAR, NEW DELHI.—The damaged and bulging veneer stones were removed, and the core was stabilized by filling the voids with cement through gravitational grouting. New veneer stones were fixed with copper dowels.

54. TUGHLUKABAD FORT, NEW DELHI.—The southern wall of the fort was restored as per the original. The work of pointing the loose joints in the ashlar masonry of the fort-wall is in progress.

55. BARE KHAN, BHURE KHAN AND CHHOTE KHAN COMPLEX OF TOMBS, HAUZ KHAS, NEW-DELHI.—-Joints of the masonry were pointed and the dead plaster was replaced by the fresh one. Missing veneer red sandstone skirting was restored as per the original. The boundary wall, enclosing three tombs, was provided by a railing on the top. The arabesque borders on the facade and in the interior of the monuments were strengthened.

56. MOHAMMADI MOSQUE, HAUZ KHAS, NEW DELHI.—The work of pointing the loose joints and reconstruction of the peripheral wall is in progress.

57. TOHFEWALA GUMBAD, HAUZ KHAS, NEW DELHI.—The buried portion of the compound wall was exposed and restored. The arches of the facade were reset, walls and para pets were replastered, and flooring was relaid in lime concrete.

Haryana

58. SURAJ KUND, DISTRICT GURGAON.—The terrace of the tank was concreted after pointing the joints of the loose masonry. The steps leading to the fort were also repaired.

Rajasthan

59. FORT, BHARATPUR, DISTRICT BHARATPUR.—The base of the moat was rebuilt with dry lime concrete masonry. The retaining wall of the moat, originally built of earth, was rebuilt with seventy-five per cent rubble masonry containing water-tightening material to avoid seepage. Patches of the rubble masonry of the fort-wall were underpinned and vegetational growth was removed.

60. PALACE. DIG, DISTRICT BHARATPUR.—The decayed rubble masonry of the overhead water tank was restored; wide and deep patches of masonry were underpinned, and cracks in the arches were grouted; The stone masonry of the tank walls was plastered, and decayed lime concrete and the stone slab lining of the tank-bed were replaced by new ones after grouting the wide cracks. Damaged decorated fountains were replaced along with their pedestals.

EASTERN CIRCLE

Assam

61. AHOM RAJA'S PALACE, GARHGAON, DISTRICT SIBSAGAR.—The fallen vaulted roof of the northern corridor was restored. The flooring was repaired by replacing worn-out bricks and plastering. A garden was laid in the compound of the palace.

62. DWARGARILLA ROCK INSCRIPTION, KAMAKHYA HILL, KAMAKHYA, DISTRICT GAUHATI.—Suitable fencing was provided.

63. GANESH MANDIR, KAMAKHYA HILL, DISTRICT GAUHATI.—A fencing was provided to avoid encroachment.

64. VISHNUDOL, GAURISAGAR, DISTRICT SIBSAGAR.—Minor repairs like pointing, water-tightening, underpinning, clearing of jungle, etc. were carried out.

65. KARENGHAR PALACE, JAYASAGAR, DISTRICT SIBSAGAR.—Pointing and watertightening of the masonry was carried out.

66. CHARIDEO MAIDAN SIBSAGAR, DISTRICT SIBSAGAR.—Watertightening and under pinning of the masonry were carried out.

67. SIBDOL, SIBSAGAR, DISTRICT SIBSAGAR.—Underpinning and jungle-clearance were carried out.

Nagaland

68. DIMAPUR RUINS, DIMAPUR, DISTRICT DIMAPUR.—Minor repairs such as pointing, watertightening, underpinning, clearing of jungle, etc. were attended to.

Orissa

69. MONASTERY 2, RATNAGIRI, DISTRICT CUTTACK.—R.C.C. roof was provided over the walls rebuilt of original bricks for housing big sculptures displayed outside the monastery.

70-72. ANCIENT SITE, HARIPURGARH, DISTRICT CUTTACK; PASHIM SOMNATH TEMPLE, BAUDH, DISTRICT PHULBANI; NILAMADHAVA AND SIDDHESWAR TEMPLES, GANDHARADI, DISTRICT PHULBANI.—Minor conservation works like restoration of missing brick masonry, resetting of loose stones, levelling and dressing of the area around the monuments, etc., were done in the above mentioned monuments.

73. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT PURI.—Expanded metal with wooden frame was provided in the ceiling inside the temple to check the nuisance of bats.

74. MAKARESWAR TEMPLE, BHUBANESWAR, DISTRICT PURL —Dislocated stones of the temple were dismantled part by part and reset to their original alignment after repairs.

75. VAITAL DEUL, BHUBANESWAR, DISTRICT PURL—Old stone pavement was relaid with new ashlar stones with proper slope. The compound wall was raised to prevent the inflow of rain water from the road side.

76-80. BRAHMESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI; NABAKISHORE TEMPLE, BHUBANESWAR, DISTRICT PURI; RAMESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI; SISIRESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI; YAMESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI.—Minor conservation works like grouting, pointing, watertightening, replacing of missing stones, etc., were done in the above-mentioned monuments.

81-84. BAKESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI; BRAHMESWAR TEMPLE, BHUBANESWAR, DISTRICT PURI; CHAUSATH-YOGINI TEMPLE, BHUBANESWAR, DISTRICT PURL—Fencing was done around the above-mentioned monuments.

85. SUN TEMPLE, KONARAK, DISTRICT PURL—The work of providing pathways, laid with stones around *natamandira* and main temple, is in progress. Some minor repairs to the temple were also attended to.

86. JAGANNATH TEMPLE-COMPLEX, PURI, DISTRICT PURL—The following conservation works were carried out: (i) replacing the broken stones with new ones, properly cut, dressed and carved with floral and geometrical designs, as per the original, at the Lakshmi temple; (ii) applying apoxy resin to the joints and cracks in the *mandapa,* which were grouted earlier at the

Lakshmi temple; (iii) grouting the cracks, filling up of voids and pointing the joints in the stone masonry of the main temple, (iv) reterracing the damaged roof of the *Kurmibera;* and (v) fencing of the newly acquired land around the temple (pl. LXX and LXXI).

West Bengal

87-88. KALACHAND TEMPLE, BISHNUPUR, DISTRICT BANKURA; RADHA BINOD TEMPLE, BISHNUPUR, DISTRICT BANKURA.—Fencing of the protected area was done around the above-mentioned monuments.

89. RAMACHANDRA TEMPLE, KALNA, DISTRICT BURDWAN.—With a view to restoring the temple on the original pattern as far as possible, the work of reterracing of the roof, plastering of the walls, restoration of the broken masonry etc., was executed.

90. RATNESWAR TEMPLE, KALNA, DISTRICT BURDWAN.—The repairs executed to this temple include: (i) providing new pillars along the pathways where the original ones were missing; (ii) reproduction of carvings and decorations as per the originals; (iii) reterracing after removal of vegetation growth; and (iv) grouting and stitching of vertical cracks.

91. SIVA TEMPLE 108, KALNA, DISTRICT BURDWAN.—Roof of the temple was repaired by providing lime terrace.

92. DAKHIL DARWAZA, GAUR, DISTRICT MALDA.—The work of renovating the fallen vaulted roof is in progress.

93. GUMTI GATE, MALDA, DISTRICT MALDA.—Minor conservation works, such as under pinning, plastering, etc., were taken up.

94. HAZARDUARI PALACE AND IMAMBARA, MURSHIDABAD, DISTRICT MURSHIDABAD.—The work of renovating the damaged roofs of the monument by replacing the old masonry, changing the worn-out *barghas* of the ceiling and reterracing the roof, is in progress.

95-97. TOMB OF SIRAJU'D-DAULA, KHUSBAGH, DISTRICT MURSHIDABAD; KATRA MOSQUE, MURSHIDABAD, DISTRICT MURSHIDABAD; TOPKHANA, MURSHIDABAD, DISTRICT MURSHIDABAD.—Repair-work including underpinning, reproducing ornamental brick work with dressed original bricks, renewing brick pavement, plastering of compound wall, painting and lime washing, etc., was executed at the above-mentioned monuments

FRONTIER CIRCLE

Haryana

98. MUGHAL GATEWAY, GHARAUNDA, DISTRICT KARNAL.- Lakhauri brick-work in lime mortar was provided in missing patches of walls and arches of the two gateways after removing the decayed bricks and dead mortar. Repairs to the damaged lime concrete flooring were also carried out.

99. SHAIKH CHILLI'S TOMB, THANESAR, DISTRICT KURUKSHETRA.- Cracks had developed in the walls and vaulted roof of the chambers and the passage leading to the grave, under the upper terrace of the tomb, due to the sinking of walls. The platform around the main tomb

had also developed cracks and sunk in some places. In order to carry out the repairs to the walls and for grouting of cracks with liquid lime cement mortar, the platform was dismantled, overburden of earth was removed and repairs to the walls and vaulted roof were carried out with *lakhauri* bricks in lime cement mortar after grouting and stitching the cracks.

100. SHAH IBRAHIM'S TOMB, NARNAUL, DISTRICT MAHENDERGARH.—Roof terrace of the tomb was properly watertightened after removing the dead concrete and lying fresh cement lime concrete. Missing rubble stone wall of the forecourt of the tomb was restored and earth filling was done to maintain the level.

101. SHAH QULI KHAN'S TOMB, NARNAUL, DISTRICT MAHENDERGARH.—Fresh cement lime plaster was provided on the extrados of the tomb after removing the dead plaster and grouting the cracks through which water was leaking and damaging the ceiling and the structure. The terrace around the dome was also repaired. One of the heavy and large stones of the parapet, which was dislodged, was reset in the original position. Stone slabs of the plat form, which were sunken, were dismantled and reset after providing a cushion of cement lime concrete. The joints of the stone slabs were pointed.

102. BAG-I-FAIZ GATE, PANIPAT, DISTRICT PANIPAT.—Decayed bricks and dead lime mortar from the walls and arches were removed and *lakhauri* brick-work in lime mortar matching the original was provided.

103. KHAWAJA KHIZR'S TOMB, SONEPAT, DISTRICT SONEPAT.—Dead plaster of the leaking dome of the tomb was completely removed from the extrados and the surface was provided with fresh cement lime plaster matching the original, after clearance of vegetation and grouting of the deep cracks and filling up of holes and hollows with liquid cement lime mortar.

Himachal Pradesh

104. BRIJESHWARI, HARI RAI AND LAKSHMI NARAYAN TEMPLES, CHAMBA, DISTRICT CHAMBA.—Lightning conductors of copper flat were provided to the temples.

105. BUDDHIST MONASTERIES, TABO, DISTRICT LAHUL AND SPITI.—Leaking roofs of the Lang Chedbo Gompha and the verandah were watertightened -after removing the earth and providing alkathene sheet covered by earth and the surface was finished with mud plaster mixed with hay and dung. The leaking roof of the Duwang Gompha was also watertightened by providing earth and mud plaster.

Jammu and Kashmir

106. AVANTISVAMI TEMPLE, AVANTIPUR, DISTRICT ANANTNAG.—Flooring at the entrance and the pathway leading to main shrine were relaid with stone slabs.

107. AVANTISVARA TEMPLE, AVANTIPUR, DISTRICT ANANTNAG.—The work of providing M. S. railing on the front side and barbed wire fencing on the other sides of the temple was completed.

108. ANCIENT TEMPLE, LODUV, DISTRICT ANANTNAG.—Accumulated silt and mud were removed from the masonry tank around the temple after pumping out the water.

109. MUGHAL ARCADE, VERINAG, DISTRICT ANANTNAG.—Vaulted roof of the main arcade of the famous spring was watertightened.

110. BUDDHIST MONUMENTS, PARIHASPURA (DIWAR YAKMANPUR), DISTRICT BARAMULLA.—Protected area around the monument was fenced with barbed wire for security and safety of sculptures and architectural members.

111. SANKARAGAURISWARA TEMPLE, PATTAN, DISTRICT BARAMULLA.—Repairs to the damaged fencing were carried out to prevent entry of cattle into the temple premises.

112. BUDDHIST SITE, USHKAR, DISTRICT BARAMULLA.—Protected area of the site was fenced and a drain was provided to divert the storm water from the hills which would damage the site.

113. ANCIENT TEMPLE, BILLAWAR, DISTRICT KATHUA.—Vegetation growth on the *sikhara* of the main shrine was cleared and the surface was treated with chemicals for the removal of moss and lichen growth.

114. AKHUN MULLA SHAH MOSOUE, HARI PARBAT, DISTRICT SRINAGAR.—Decayed brick work was dismantled and restored with country brick work in lime mortar. Recessed pointing in lime mortar was done on the inner walls of the main mosque, after raking the joints and washing out dead mortar thoroughly.

115. BUDDHIST SITE, HARWAN, DISTRICT SRINAGAR.—Apsidal temple on the upper terrace which was buried due to the landslide caused by the cloud-burst in 1973 was partly salvaged after removal of debris (pl. LXXII).

116. KATHI DARWAZA, SRINAGAR, DISTRICT SRINAGAR.—Original plan of the walls and stairs was exposed by removing accumulated earth and debris from the sides of the gateway. Core of the rubble walls was repaired and the height of the walls raised.

117. PATHAR MASJID, SRINAGAR, DISTRICT SRINAGAR.—Leaking roof of the mosque was watertightened by removing the dead concrete and laying fresh concrete after carrying out repairs to the sloping dwarf walls and *chhajja* in conformity with the original. Wall lining and arch on the southern end were restored with ashlar stone masonry as per the original (pl. LXXIII).

118. PARI MAHAL, SRINAGAR, DISTRICT SRINAGAR.—Top of the retaining wall of the third terrace was exposed after removing the flower beds laid by the Department of Horticulture, Government of Jammu and Kashmir. Dislodged portion of the wall was dismantled and was restored to the height of terrace with rubble stone masonry in cement lime mortar. Joints in the masonry wall were recess-pointed with concreted lime mortar, matching the original.

119. DEVI BHAGWATI TEMPLE, MANWAL, DISTRICT UDHAMPUR.—Dislodged stones of the leaking and dilapidated *sikhara* of the main shrine were dismantled and reset in cement lime mortar. Cracked lintel of the entrance to the antechamber was strengthened by providing a concealed girder and the ashlar masonry columns supporting the lintel were removed. Protected area around the temple was properly dressed after cutting the undulations and filling the depressions. Different terraces were formed to lay out a garden.

120. KALA DERA TEMPLE 1, MANWAL, DISTRICT UDHAMPUR.—Flooring and extant walls of the main shrine were repaired in conformity with the original after dismantling the dislodged stones. Cracked base of a pillar was strengthened.

121. KALA DERA TEMPLE 2, MANWAL, DISTRICT UDHAMPUR.—Northern wall of the *mandapa* of the temple was restored in conformity with the original plan and elevation. Recessed pointing of the joints in the stone masonry of the sanctum was also carried out.

122. TEMPLE 2, KRIMCHI, DISTRICT UDHAMPUR.—Dislodged and decayed stories of the walls of the *mandapa* were dismantled, and the work of restoring walls with new stones in cement lime mortar in conformity with the original is in progress.

123. TEMPLE 3, KRIMCHI, DISTRICT UDHAMPUR.—Dislodged stones of the southern portion of the temple were dismantled and reset in confirmity with the original.

124. FORT, RAMNAGAR, DISTRICT UDHAMPUR.—Cracked portion of one of the bastions was properly stitched with stone-work in cement mortar, matching the original, after clearing the vegetation growth and dead mortar.

125rSAMADHi OF QUEEN OF RAJA SUCHET SINGH, RAMNAGAR, DISTRICT UDHAMPUR.—Fallen compound wall of the *samadhi* was restored to its original height with stone-work in cement mortar.

Punjab

126. FORT, BHATINDA, DISTRICT BHATINDA.—Repairs were carried out to the steps, walls and vaulted arches of the staircase leading to the southern terrace on the rampart in conformity with the original. A portion of brick pavement was also repaired by pointing the joints of bricks to prevent seepage of water in the fortification-wall.

127. SARAI AND GATEWAY, DAKHNI, DISTRICT JULLUNDUR.—Repairs to the main gateway were carried out. Patches of decayed country brick-work were removed and fresh brick-work in cement lime mortar was provided as per the original. A portion of roof terrace was also provided with fresh cement lime concrete after removal of dead concrete to prevent leakage of water.

128. TOMBS, NAKODAR, DISTRICT JULLUNDUR.—Protected area around the tombs was enclosed with M. S. railing on a dwarf wall, and the surroundings improved.

NORTHERN CIRCLE

Uttar Pradesh

129 FORT AGRA, DISTRICT AGRA.—Brick-on-edge flooring in front of Diwan-i-Am was re-laid as per the original after weeding out the grass. Joints in the walls of the *dalans* were pointed. Road in between the courtyards was reconditioned. Ceiling and dome of southern gate of the forecourt were plastered with specially prepared lime plaster. Ancient pipe-line in the Khas Mahal was conditioned and joints in the marble slabs of the tank were pointed. Moss and lichen were removed from the gateway leading to the Anguri Bagh. The work of laying flag-stone flooring of the Durbar Hall is in progress.

The work of replacing missing inlay pieces in the Janamaz of Moti Masjid, throne room, etc is in progress Missing glass pieces in a portion of the side wall of the entrance gate to Sheesh Mahal were restored (pl LXXIV), and the work of reproducing richly-carved, ornamental, geometrical and floral designs is in progress.

Wall of the moat was reconditioned by underpinning and plastering and giving a colour wash matching with the adjoining surface.

Birbal House was kept neat and tidy by removing debris, etc.

130. CHINI-KA-RAUZA, AGRA, DISTRICT AGRA.—Protection wall towards the river Yamuna was restored wherever missing and the height was raised. Some old structures in the north western corner of the monument were exposed after removing debris. Collapsed portions in the south-western corner and southern vestibule were restored on original pattern by using earthen pitchers in the domed roofs. Lower chambers of the monument were cleared of debris and a staircase in the south-western corner of a room was exposed and restored.

131. FIROZ KHAN'S TOMB, AGRA, DISTRICT AGRA.—Hollowed patches in the compound wall were underpinned and joints pointed. Pulverized concrete of terrace and floorings was replaced.

132. HUMAYUN'S MOSQUE, AGRA, DISTRICT AGRA.—Back wall of the mosque was repaired by underpinning and pointing the joints. The dead concrete of flooring and roof was replaced.

133. IDGAH, AGRA, DISTRICT AGRA.—Underpinning and pointing were carried out to the northern and eastern boundary walls. The plaster on the west north-western wall was filleted.

134. ITMAD-UD-DAULA'S TOMB, AGRA, DISTRICT AGRA.—The work of replacing missing inlay pieces and decayed red sandstone inlaid panels in the gateway is in progress. All fountains have been conditioned (pl. LXXV).

135. JAMA MASJID, AGRA, DISTRICT AGRA.—The southern dome over the prayer hall was watertightened by pointing, resetting loose stones and replacing inlay bars. The work in other two domes is in progress. Decayed plaster on the interior of the parapet-wall towards north and east was removed and replastered. Replastering was done to the staircase leading to the terrace. The work of replacing deteriorated *chhajja* stones over the *dalans* of the courtyard is in progress.

Veneering stones of the northern parapet wall, exfoliated and bulged due to the growth of a pipal tree underneath, were dismantled and reset after removing the roots of the tree and chiselling the exfoliated facade.

136. RAM BAGH, AGRA, DISTRICT AGRA.—Debris from the channels lying between stone pathways and *chabutars* was cleared.

137. R. C. CEMETERY, AGRA, DISTRICT AGRA.—Bulged and collapsed portions of the boundry wall, towards western and southern sides, were restored to its original alignment and height. The dome was repaired by removing the dead plaster and stitching the cracks and replastering. Loose and bulged stones of old graves were reset in position and pointed.

138. TAJ-MAHAL, AGRA, DISTRICT AGRA.—The work of reconditioning of the flooring of the causeway and portions in the northern, southern and western sides by replacing decayed stones, resetting the sunken stones, pointing, etc., is in progress. Replacing the missing inlay pieces in the outer facade of the main mausoleum on the northern, southern and north-western sides, is in progress (pl. LXXVI). Damaged flooring of the underground cells and passage was reconditioned, and the decayed plaster on the walls and ceiling was removed and replastered after grouting and filling up the wide and deep cracks. Western

side of the Naubat Khana was renovated by reconditioning the flooring, providing Mughal pattern doors, pointing, etc., to house a new Museum. Flooring of the eastern varandah and courtyard of the tomb of Sirhind Begum was reconditioned and decayed veneering stones of the dome were replaced. The black marbles of the *gaz* of Janamaz of Fatehpuri mosque were replaced wherever necessary. Damaged and broken *chhajja* stones of the *gaushala* towards the north-eastern and north-western sides were replaced, and the parapet wall was repaired and plastered.

Ceiling of arch of Khan-i-Alam gate, over which water tank for fountains is situated, was pointed and plastered. The work of laying flooring of the western *dalan* of the southern main entrance gate is in progress.

139. ZAFAR KHAN MOSQUE (LAL MASJID), AGRA, DISTRICT AGRA.—The western wall of the mosque was underpinned and the concrete of the roof was replaced. The courtyard was provided with flag-stone flooring.

140. ANCIENT MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.—A railing in the old pattern was provided in front of Jodhabai palace. Collapsed front wall of the Mint house was reconstructed to its original level (pl. LXXVII). Pulverized concrete and plaster of the dome were removed and renovated as per the original. Open joints in the inner structures were filled up. Collapsed arches were restored. Laying a flooring in geometrical pattern, as per the original, in Diwan-i-Khas was completed. Work of repairing the drains from Diwan-i-Am to Turkish Sultan's house is in progress. Missing inlay pieces of Buland Darwaza were replaced. Extensive repairs to the treasury were taken up, and the pillars in the verandah were conditioned. Collapsed portion of the bastion of the fortification-wall between Agra gate and Lal Darwaza was restored to its original condition (pl. LXXVIII).

141. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—Black spots on the entrance gateway were cleaned and missing inlay pieces were replaced. Flooring of the main tomb was laid with concrete, and red sandstone aprons were provided wherever necessary (pl. LXXIX).

142. KATRA PHULEL, TAJGANJ, DISTRICT AGRA.—Minor repairs such as underpinning, pointing, plastering, etc., were carried out.

143. EXCAVATED SITE, AHICHCHHATRA, DISTRICT BAREILLY.—Bulged-out wall facing south of A.C.I, was dismantled and reconstructed as per the original.

144. TOMB OF HAFIZ REHMAT KHAN, BAREILLY, DISTRICT BAREILLY.—Decayed plaster on the walls was replaced and decayed flooring was renewed with fresh lime concrete. Vegetation growth was removed from the entire structure and cracks were watertightened.

145. ASOKAN ROCK-EDICT, KALSI, DISTRICT DEHRA DUN.—Ramp leading to the rock-edict was paved with rubble stones. A portion of collapsed retaining wall was restored as per the original.

146. TOMBS OF BALAPIR AND MOHAMMAD MEHDI, KANNAUJ, DISTRICT FARRUKHABAD.—The work of reconditioning the flooring by removing grass and roots of vegetation, and replacing the missing and decayed stone slabs is in progress.

147. RAJA GANGADHAR-KI-CHHATRI, JHANSI, DISTRICT JHANSI.—Caved-in portion of the brick masonry was underpinned, and the decayed plaster was removed and replastered. Flag stone apron was provided along the interior compound-wall wherever necessary.

148. RANI LAKSHMI BAI PALACE, JHANSI, DISTRICT JHANSI.—Extensive repairs were carried out to recondition the south-western corner of the monument.

149. JAINA TEMPLE, CHANDPUR, DISTRICT LALITPUR.—Damaged dry masonry walls on the east, west and south, were dismantled and rebuilt as per the original. Tiled *burjee* was realigned and decayed concrete of the roof was removed and reconcreted.

150. SURRU-MARIA TEMPLE, CHANDPUR, DISTRICT LALITPUR.—Plinth of the temple was exposed by removing debris, and the damaged portion was underpinned. Loose carved stones of the *sikhara* were set in position, and the temple was made watertight by filling open joints.

151. GUPTA TEMPLE, DEOGARH, DISTRICT LALITPUR.—The core of the *sikhara* and the outer facade of the temple were repaired to prevent the percolation of water.

152. KURAIYA BIR TEMPLE, DEOGARH, DISTRICT LALITPUR.—Out-of-plumb southern wall of the temple was dismantled and reconstructed as per the original by tying the members with copper clamps.

153. VARAHA TEMPLE, DEOGARH, DISTRICT LALITPUR.—Joints in the facade of the temple and the flooring were pointed.

154. OLD FORT, TALBEHAT, DISTRICT LALITPUR.—The masonry of the central gate was pointed and watertightened. Vegetation growth and grass were removed from the structures inside the fort.

155. BARA IMAMBARA, LUCKNOW, DISTRICT LUCKNOW.—Six domes over the north-western wing of the main gate were replastered. Pulverized plaster on the eastern external wall of the second forecourt was removed and redone as per the original, reproducing mouldings and carvings. Underpinning of the masonry work and replastering including reproducing miniature domes and cusped arches, etc., were done in the main gate leading to the *baoli.* Ornamental pillars, pilasters and the facade panels of the Imambara were plastered. The decayed concrete of third floor of the labyrinth was removed and reconcreted and the plastering work in the adjacent wing of the labyrinth was completed.

156. GATEWAY 1, AMJAD ALI SHAH, LUCKNOW, DISTRICT LUCKNOW.—Decayed and pulverized plaster of the main passage and southern facade was removed and replastered with lime *surkhi* mortar, and geometrical designs, floral work, mouldings, etc., were reproduced to the extent possible.

157. ROMI GATE, LUCKNOW, DISTRICT LUCKNOW.—Reconstruction of collapsed south western *minar* of the gateway was completed. Cells of ground floor, vaulted ceiling of south western wing and arches below the miniature domes etc., were replastered.

158. TOMB OF MUSHIRZADI, LUCKNOW, DISTRICT LUCKNOW.—Pulverized plaster of the extrados and inner surface of the central dome and of the plinth was removed and redone. Moulded and floral works on the facades of the first and second floors above the *chhajja* level were restored as per the original. Restoration of collapsed *chhatri* is in progress.

159. TOMB OF SADAT ALI KHAN, LUCKNOW, DISTRICT LUCKNOW.—Pulverized and decayed plaster of the extrados of central dome was removed and redone, reproducing the mouldings

as per original. Replastering, with carvings and floral designs, of the eastern and western facades above the first floor-level miniature domes and corner *chhatris* is in progress.

SOUTHERN CIRCLE

Kerala

160. FORT ST. ANGELO, CANNANORE, DISTRICT CANNANORE.—Damaged flooring of the General's building was removed and relaid with fresh concrete. Walls of the rooms and semi circular flooring of the first floor were replastered with combination mortar. Tiled roof over the first floor was removed and relaid after replacing the rotten wooden members and broken tiles.

A cattle trap was provided at the entrance of the fort to prevent the entry of the cattle. Decayed wooden members of the roof of the Admiralty Building were replaced with new teak wood members. Damaged old wooden shutters of the main entrance gate were replaced with new ones as per the original. Wooden trellis screens of the horse stables were replaced wherever missing as per original, and were given two coats of preventive enamel paint of suitable colour.

161. MATTANCHERY PALACE, COCHIN, DISTRICT ERNAKULAM.—Damaged flooring of the Ramayana chamber was paved carefully, and rotten wooden members such as beams and rafters supporting the floor were removed and replaced by new teak wood members and the floor was laid afresh. The work was executed delicately and successfully without affecting in any way the paintings on the walls of the chamber. To prevent persistent dampness due to capillary action in the walls of the Navarathri Hall, a damp-proof course was provided at the base of the wall by introducing granite stone slabs into the wall covering the entire thick ness of the wall.

162. ST. FRANCIS CHURCH, COCHIN, DISTRICT ERNAKULAM.—A damp proof course of granite slabs was inserted so as to cover the width of the wall all along the bottom portion of the outer walls of the Church in order to protect the walls from being affected by the salinity of the sub-soil water by capillary action. Affected colour wash on the interior face of the walls was scraped out and a fresh colour wash in two coats with snowcem of suitable colour was provided.

163. FORT, PALGHAT, DISTRICT PALGHAT.—The work of restoring the fallen portion of the side walls of the stepped-well inside the fort was completed. The work of removing the heavy jungle growth from the wall tops and faces and underpinning of the decayed and fallen portions of the wall including watertightening of the top is in progress.

164. SIVA TEMPLE, PERUVANAM, DISTRICT TRICHUR.—Leaking roof of the *namaskara-mandapa* was removed and relaid after replacing the rotten wooden rafters. The wood work was treated with colourless wood preservative.

165. VADAKKUNATHA TEMPLE, TRICHUR, DISTRICT TRICHUR.—Roof of the *nandimandapa,* which was profusely leaking and thus adversely affecting the paintings on the walls, was removed and relaid after replacing the rotten wooden members of the roof as well as the broken tiles. Copper sheets provided over the roof of the main shrine and *namaskara-mandapa* were applied with suitable paint to prevent corrosion after attending to minor repairs to the copper sheets to arrest leakage.

166. FORT ANJENGO, ANJENGO, DISTRICT TRIVANDRUM.—A portion of the inner face of the eastern wall, which had developed a horizontal crack and collapsed during the last rains, was restored in confromity with the original, using fresh laterite cut stones to the extent necessary by providing proper bonding with the core of the wall.

Pondicherry

167. MOOLANATHASWAMY TEMPLE, BAHOUR, DISTRICT PONDICHERRY.—Accretionary brick walls provided to support the broken ceiling slabs and the floor concrete of the *maha-mandapa* were removed replacing the broken slabs with new ones and providing flag-stones. Skylights were provided in the roof terrace to admit adequate light into *maha-mandapa.* Stucco figures over the main *vimana* of the temple were strengthened by mending wherever necessary and the accretionary brick structures covering the sculptures and inscriptions on the southern and western exterior faces of the *vimana* were removed (pl. LXXX).

168. THIRUKUNRAKKUDI MAHADEVA TEMPLE, MADAGADIPATTU, DISTRICT PONDICHERRY.—Damaged brick flooring of the small courtyard in front of the main temple was replaced by flag-stone flooring. The existing fence line on the southern side was shifted further to bring it within the archaeological area. Additional area so included was dressed and levelled.

169. THOTHADRINATHA TEMPLE, TIRUBHUVANAE, DISTRICT PONDICHERRY.—During the course of clearing and levelling the area in front of the temple to erect the fencing, plinth of a *mandapa* with ornate mouldings and inscriptions engraved on it was brought to light. Number of loose members of the superstructure with inscriptions were also collected and neatly stacked. Barbed wire fencing with a gate was provided around the protected area of the monument.

170. VADUGIRISVARA TEMPLE, TIRUVANDARKOIL, DISTRICT PONDICHERRY.—Debris was cleared from the courtyard of the *prakara,* and the flooring was repaved with available old flag stones.

Tamil Nadu

171. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—Damaged and worn-out portions of the *pitha* mouldings were restored in conformity with the original (pl. LXXXI), besides removing the accretionary lime plaster. The voids and the wide joints of the masonry were filled up and surface finished to match with the original. The work of removing the accretionary lime plaster over the walls and images of the main *vimana* of the temple-complex is in progress (pl. LXXXI I).

172. VAIKUNTHAPERUMAL TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—A portion of the tiled roof of the damaged *madapalli* or temple kitchen abutting and obstructing the view of the mouldings and carvings of the *gopura* was removed, and the kitchen reconditioned.

173. FIVE RATHAS, MAHABALIPURAM, DISTRICT CHINGLEPUT.—Courtyard within which arc located the *rathas* was extended towards north, with a small landing between the higher road level and the lower level of the courtyard. The slopes of the extended courtyard were provided with stone pitching and a flight of steps of dressed stones. The middle landing portions on either side of the flight of steps as well as the raised sandy platform on the western side were laid with turf after spreading a layer of red earth and manure over sand. A sand-dune, serving as a back-drop to the *rathas* on the eastern side, was planted with casurina saplings to break the

monotony and to prevent erosion. A narrow flight of steps on the south-western side of Dharmaraja *ratha* was dismantled and a broad flight of steps over a gentle slope with dressed stones was provided.

174. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHINGLEPUT.—Wide masonry joints in the *prakara* wall as well as the walls of the Rajasimhesvara temple were grouted, pointed and surface finished, matching with the rock face, after thoroughly raking and washing (pl. LXXXIII).

175. DHARMESVARA TEMPLE, MANIMANGALAM, DISTRICT CHINGLEPUT.—Protected area around the temple was demarcated and the work of fencing the area is in progress. The students of Vivekananda College, Madras, who adopted this temple under N.S.S. programme, cleared the vegetation growth over the temple and its *prakara* and cleaned the surroundings of the temple.

176. ATIRANACHANDA ROCK-CUT TEMPLE, SALUVANKUPPAM, DISTRICT CHINGLEPUT.—Stone pavement was provided to the courtyard to prevent the sand of the courtyard spilling in to the *mukha-mandapa* and damaging the inscriptions engraved therein.

177. KANTHALINGESVARA TEMPLE, TENNERI, DISTRICT CHINGLEPUT.—A culvert over the drain at the entrance to the archaeological area was provided. An approach pathway was laid within the area, and the same was spread with *muram.* The students of the Department of History and Archaeology, Madras University, under N.S.S. programme, cleared the vegetation growth over the temple and also cleared the area around (pl. LXXXIV).

178. VAIKUNTHAPERUMAL TEMPLE, UTTIRAMERUR, DISTRICT CHINGLEPUT.—Dislodged and out-of-plumb huge veneer stones of the *adhisthana* with inscriptions including the famous one of Parantaka Chola (A.D. 919-920), referring to the elections to the local bodies in Chola times, were dismantled and restored back to their original position, tying and securing them with copper dowels after strengthening the foundation and the core. The work was carefully executed without causing any damage to the inscribed surface of the stones. Damaged door of the *vahana-mandapa* was replaced with new one reinforced with M.S. bars.

179. JAINA TEMPLE, METTUPUDUR, DISTRICT COIMBATORE.—Flooring of the *maha-mandapa* as well as *mandapa* in front, was removed and relaid over a cushion of brick jelly concrete, with old stones after dressing them.

180. BLOCK, OLD OFFICER'S MESS, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—Entire exterior face of the building housing the Museum was cleared of old and decayed colour wash coating and a new snowcem colour wash was given after preparing the surface. Besides, the wood work of the monument was painted after removing the old coat.

181. CLIVE'S BUILDING, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—Decayed plaster, affected by salt action and dampness over the walls of the rooms of the northern wing in the ground floor was removed and replastered and finished with colour wash of suitable colour.

182. WALLAJAH AND ST. GEORGE GATES, FORT ST. GEORGE, MADRAS, DISTRICT MADRAS.—Roof terrace of the gates was cleared of vegetation growth and dead concrete was removed and relaid with fresh brick jelly concrete and plastered with combination mortar to render the roofs watertight.

183. SWAYAMBHUNATHA TEMPLE, KILPUTTUR, DISTRICT NORTH ARCOT.—Barbed wire fencing was provided around the archaeological area.

184. SOMANATHA TEMPLE, MELPADI, DISTRICT NORTH ARCOT.—Approach pathway between the first and the second *gopuras* was paved with stones.

185. KONAR TEMPLE, TIRUMALPUR, DISTRICT NORTH ARCOT.—The works executed include: barbed wire fencing of the archaeological area around the monument; providing of welded mesh gate to the main entrance of the temple; improving of the existing drainage system by pitching the sides and bottom with rough stones; and strengthening of the existing stone revetment provided to the slopes of the sunken court around the temple by pointing and grouting the joints and cavities.

186. FORT, VELLORE, DISTRICT NORTH ARCOT.—The works executed include: under pinning in brick masonry, in conformity with the original, the damaged portions of the bastion on the western side of the lower rampart; dismantling and reconstructing as per the original, the bulged out portions of the upper rampart wall on the southern side of the fort; and water-tightening the top portions of the upper rampart walls by laying fresh concrete and finishing the surface by plastering.

187. JALAKANTESVARA TEMPLE. VELLORE, DISTRICT NORTH ARCOT.—The works executed include: clearing accumulated silt and rubbish from the outlets of the choked drain, and providing of man-holes at regular intervals to facilitate periodical cleaning; and providing barbed wire fencing of the archaeological area on the front and rear sides of the temple.

188. SIVA TEMPLE, KEERANUR, DISTRICT PUDUKKOTTAI.—The damaged and sunken portions of the stone paved flooring was reconditioned.

189. MUVARKOIL, KODUMBALUR, DISTRICT PUDUKKOTTAI.—The works executed include: grouting of the voids in the masonry and joints in the veneer stones of the existing *vimanas* with combination mortar, and finishing of the surface matching the original; clearance of accumulated debris on the southern and eastern sides; and dismantling and restoring, as per the original, the bulged portions of the side walls of the step-well with combination mortar after strengthening the core.

190. MUCHUKUNDESVARA TEMPLE, KODUMBALUR, DISTRICT PUDUKKOTTAI.—Accumulated earth in front of the temple was removed to expose buried portions of the entrance gate and *prakara* walls.

191. SIKHANATHASWAMY TEMPLE, KUDUMIYAMALAI, DISTRICT PUDUKKOTTAI.—The Works executed include: removal of dead concrete on the roof of the *kalyana-mandapa* and relaying with fresh brick jelly concrete in lime and finishing the surface to render the roof watertight; dismantling of the northern *prakara* wall which had developed a vertical crack and reconstructing it in conformity with the original; rendering the top of the same *prakara* wall near the *mada-palli* watertight; and removal of the damaged flooring of the *madapalli* and relaying with same stones.

192. MADATHUKOIL, NANGUPATTI, DISTRICT PUDUKKOTTAI.—All the loose sculptures scattered in the archaeological area were shifted to the interior of the temple and fixed on the masonry pedestals.

193. RAJENDRA CHOLESVARA TEMPLE, PONNAMARAVATI, DISTRICT PUDUKKOTTAI.—The works executed include: removal of thick lime coating over the walls and pillars of the main temple and washing of the surface; removal of sunken flooring and resetting after dressing the old stones; plastering of the concreted surface of the terrace roof of the temple with a neat coat of combination mortar to ensure easy flow of rain water; and laying of an underground hume pipe drain connecting the *prakara* to the pond nearby to drain out storm water.

194. JAINA BEDS AND INSCRIPTIONS, SITTANNAVASAL, DISTRICT PUDUKKOTTAI.—The approach path to the top of the hill was improved by cutting afresh the steps to make them regular and less steep. G. I. pipe railings were provided on either side of the steps for facilitating climbing the hill.

195. JAINA TEMPLE, SITTANNAVASAL, DISTRICT PUDUKKOTTAI.—The works executed include: strengthening of the approach to the cave temple by providing retaining walls on either side; restoration of the collapsed revetment in front of the cave; and laying of stone slab flooring and recess pointing of the joints in the front portion of the *mandapa* of the cave temple.

196. SIVA TEMPLE, SURIYUR, DISTRICT PUDUKKOTTAI.—Heavy growth of jungle in and around the temple was cleared and the surroundings of the temple were levelled and rendered tidy.

197. FORT, TIRUMAYAM, DISTRICT PUDUKKOTTAI.—A number of ancient cannon which were buried underground were unearthed and fixed on masonry pedestals.

198. SATYAMURTHYPERUMAL TEMPLE, TIRUMAYAM, DISTRICT PUDUKKOTTAI.—Terrace roof which was profusely leaking was repaired by grouting and filling up of cracks with combination mortar and the top finished with neat coat of plaster to ensure easy flow of water.

199. VISHNU TEMPLE, TIRUMAYAM, DISTRICT PUDUKKOTTAI.—Leaking terrace of the front *mandapa* was watertightened and lighting arrangements were made to the cave-temple.

200. FORT, ATTUR, DISTRICT SALEM.—Damaged concrete flooring of the *kalyana-mandapa* was removed and relaid with fresh lime concrete with brick jelly. Patch plastering to the walls with combination mortar of matching colour was done. Area around the Kalyana Mahal was provided with barbed wire fencing.

201. NARASIMHASWAMY TEMPLE, NAMAKKAL, DISTRICT SALEM.—Damaged flooring of the north-western portion of the *prakara* was removed and relaid.

202. DURBAR HALL, KRISHNAGIRI FORT, GINGEE, DISTRICT SOUTH ARCOT.—Decayed plaster on the outer face of the main walls of the hall was completely stripped and the walls replastered with combination mortar as per the original.

203. EXCAVATED STRUCTURES NEAR HORSE STABLES, GINGEE FORT, GINGEE, DISTRICT SOUTH ARCOT.—The structures were consolidated and rendered watertight.

204. BARRACKS AREA, GINGEE FORT, GINGEE, DISTRICT SOUTH ARCOT.—Area around the barracks was cleared of vegetation growth and debris, and provided with barbed wire fencing.

205. KALYANA MAHAL, GINGEE FORT, GINGEE, DISTRICT SOUTH ARCOT.—Systematic clearance work of the mound in front of the Mahal is in progress, resulting in the discover)' of a structural complex.

206. KALI AMMAN TEMPLE, RAJAGIRI FORT, GINGEE, DISTRICT SOUTH ARCOT.—An approach road with revetment on either side was laid for providing access to the temple.

207. MANDAPAS, INNER CITADEL, GINGEE, DISTRICT SOUTH ARCOT.—A number of loose sculptures, ornamental balustrades, pillar-capitals and carved stones have been collected in these *mandapas* which are being reconditioned from security point of view. The work of display ing sculptures fixed on pedestal is in progress.

208. RAMPART WALL, KRISHNAGIRI FORT, GINGEE, DISTRICT SOUTH ARCOT.—With a view to restoring the collapsed portions of the rampart, as per the original, the fallen cyclopian and other useful stones were collected and stacked while removing the debris. However, a portion of the breached wall was restored.

209. SADATULLAH KHAN'S MOSQUE, GINGEE FORT, GINGEE, DISTRICT SOUTH ARCOT.—The road connecting this mosque with the Pondicherry gate was widened by removing all encroachments and the sides of the road dressed. A car park was provided near the mosque. Tourist amenities such as drinking water and stone benches under the shady trees were also provided.

210. SIVA TEMPLE, GINGEE FORT, GINGEE, DISTRICT SOUTH ARCOT.—Old drainage system was conditioned by removing accumulated earth around the temple, and flooring was paved with flag-stones. Temple-type teak wood shutters were fixed to the entrance of the main shrine.

211. VENKATARAMANA TEMPLE, GINGEE, DISTRICT SOUTH ARCOT.—A stone pitched drain on the western side of the temple, connecting the existing northern side drain, was provided to augment the problem of inundation and seepage of water into the *prakara* of the temple. The work for providing a drain on the southern side is in progress. Leaning portion of the *prakara* wall and the buttresses were dismantled and the *prakara* wall was reconstructed as per the original after consolidating the foundation as well as the core of the wall (pl. LXXXV). While exposing the moulded plinth of the front *gopura,* by removing the debris, a plinth portion of a shrine having a row of beautiful dancing figures on the *kantha* portion was exposed. Dislodged *dasa* stones of the exposed plinth were restored to their position, and top of the plinth watertightened. Besides, loose pillars found in the debris were re-erected in their original place. The sunken court in front of the *gopura,* formed due to the clearance of earth to reveal the plinth, was provided with a stone paved pathway and a flight of steps, and the sloping sides were pitched with stones (pl. LXXXVI).

Clearance of debris to expose the original floor level of the first *prakara* is in progress. A stone paved pathway was provided in between the first *gopura* and the multi-pillared hall in front of the second *gopura.* A number of masonry pillars in the multi-pillared hall were removed and replaced by original ones salvaged from the debris while clearing the second *prakara* (pl. LXXXVII).

Accretionary masonry buttress to the broken massive lintel spanning the middle bay on its front in the *mandapa* on the north-eastern corner of the pillared hall was dismantled after replacing the broken lintel with the new one dressed to the original. Roofs of the above *mandapa* and outer cloister *mandapa* on the southern and south-eastern portions were watertightened.

The dislodged and bulging portion of the plinth of the inner cloister was dismantled and reset to plumb after strengthening the core and foundation. Fallen and leaning pillars over the plinth were re-erected and the flooring paved. Accretionary masonry supports were removed.

The *maha-mandapa* of the main shrine inside the inner *prakara* was provided with flag-stone flooring and the roof was watertightened. *Dvarapala-figures* found in innumerable fragments from the debris were carefully mended and fixed on the pedestals and placed in their original place.

212. NITHISVARASWAMY TEMPLE, SRIMUSHNAM, DISTRIGT SOUTH ARCOT.—A concealed cement pipe drain was laid in order to drain out the storm water from the *prakara* of the temple into the nearby temple tank. The floor of the sunken court in front of the *gopura* as well as the the sloping sides of the sunken court were provided with stone pavement and pitching respectively. The area around the temple well, inside the *prakara,* was paved with stones after removing the loose earth. A sump was provided below the *pranala. Nandavanam* enclosure was cleared of jungle growth and the area levelled.

213. AIRAVATESVARA TEMPLE, DARASURAM, DISTRIGT THANJAVUR.—Moss and lichen growth over the walls, pillars and ceiling were cleaned to expose the paintings. Stone paved flooring of the *prakara* on the northern and north-western sides and the *kalyana-mandapa* was removed and relaid over a brick jelly concrete cushion.

214. DEVANAYAKI AMMAN SHRINE, DARASURAM, DISTRICT THANJAVUR.—Accumulated earth in the *prakara* of the shrine was removed to expose the original floor level, moulded and carved plinth, balustrades and also basement portion of the cloister cells around the *prakara* walls (pl. LXXXVIII). The work of paving the flooring with stones is in progress. New temple-type wooden doors were provided in place of the old damaged doors for the safety of the bronzes. In order to drain out the storm water from the *prakara* of this temple, the original drain through the *prakara* wall was traced. The work of constructing a hume pipe drain with in spection chambers covered with slabs, connecting the outlet in the wall and the nearby pond is in progress.

215. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—Decayed and sunken brick flooring on the northern flank of the *maha-mandapa* and *mukha-mandapa* was removed and stone slab flooring over brick-jelly concrete in lime mortar was laid restricting the area so paved only to form an apron along the base of the *mandapas.* The remaining area was laid with turf. Doors and windows in the complex were treated with two coats of approved colour paint and varnish after thoroughly scraping and cleaning the old and cracked paint coat, while the false wooden ceiling inside the *garbhagriha* of the main temple and the wooden members of the Raja *gopuram* were treated with wood preservative to prevent decay. The outer opening of the Raja *gopuram* was provided with welded mesh screens fixed to teakwood frames in order to prevent entry of bats and the misuse of the premises.

The work of cleaning the Keralanthaka and Raja *gopurams* and *vimanas* of the subsidiary shrines of moss and lichen growth over them, and rendering them watertight after strengthening the ornamental stucco work and filling and grouting the voids and joints is in progress. The work of removing thick coat of lime wash on the walls, pillars and ceilings of the main temple, to bring out the inscriptions, sculptures and other ornamental features is in progress.

216. SCHWARTZ CHURCH, THANJAVUR. DISTRICT THANJAVUR.—Decayed plaster over the interior and exterior faces of the walls of the main church as well as compound wall was removed

and replastered with combination mortar. Church walls were also given colour wash coats of approved colour. The doors and windows were painted after removing old paint.

217. ERUMBESVARA TEMPLE, TIRUVERUMBUR, DISTRICT TIRUCHCHIRAPPALLI.—Smoothened and slippery steps and landings of the approach flight of steps were removed and reset over a bed of brick jelly concrete after dressing the rise and tread portions. Accumulated debris in the outer *prakara* was removed. Damaged flooring of the *prakara* was removed and reset with same stones after dressing them properly. Temple-type teak wood doors were provided in place of old and decayed wooden and tin-sheet doors, for the safety of the bronzes.

218. BRIHADISVARA TEMPLE, GANGAIKONDASOLAPURAM, DISTRICT TIRUCHCHIRAPPALLI.—The work of removing the old lime wash coat over the walls, ceilings and pillars, in order to expose the inscriptions and sculptures, is in progress. The work of removing the moss and lichen growth over the *vimanas* and subsidiary shrines, and watertightening of the main *vimana,* is in progress.

219. VALISVARASVAMV TEMPLE, VALIKANDAPURAM, DISTRICT TIRUNELVELI.—Existing well and the tank in the outer *prakara* were desilted and deepened for augmenting the water supply to the trees in the archaeological area. Flooring of the southern side of the *prakara* was relaid with the old available stones.

SOUTH-EASTERN CIRCLE

Andhra Pradesh

220. DODDESVARA TEMPLE, DISTRICT ANANTAPUR.—Courtyard inside the temple was cleared and the compound wall was underpinned. The parapet wall of the temple was lowered. *Nandi-mandapa* was exposed and the ground around it was levelled.

221. VIRABHADRASVAMI TEMPLE, HEMAVATI, DISTRICT ANANTAPUR.—Leaking roof of the pillared *mandapa* of the temple was watertightened by laying brick courses in mortar and finishing the roof with concrete.

222. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—Electrification of the temple by the C.P.W.D. is in progress.

223. RANI MAHAL, CHANDRAGIRI, DISTRICT CHITTOOR.—Accumulated earth on the southern, western and northern sides of Rani Mahal was cleared. Relaying of the flooring in cement lime mortar and consolidation of the newly exposed plinths was completed. The basal mouldings of the monument were exposed.

224. RAJA MAHAL, CHANDRAGIRI, DISTRICT CHITTOOR.—The lower window arches on the southern side of the Raja Mahal were provided with iron grills.

225. PARASURAMASVAMI TEMPLE, GUDIMALLAM, DISTRICT CHITTOOR.—Ancient well in the temple premises was consolidated and the ground inside the compound was levelled after clearing the debris.

226. RANGINI MAHAL, GURRAMKONDA, DISTRICT CHITTOOR.—The monument was provided with new teak wood beams, and the fallen *chhajjas* were restored.

227. PALLISVARA MUDALI MAHADEVA TEMPLE, KALAKADA, DISTRICT CHITTOOR.—Flooring of *sabha-mandapa, antarala* and *garbhagriha* was paved with stones. A barbed wire fencing was provided around the protected monument. Terrace of the temple was relaid and watertightened. A door matching with the temple was provided to the main entrance.

228. VAIDYANADHASVAMI TEMPLE, PUSHPAGIRI, DISTRICT CUDDAPAH.—Foundation of the compound wall of the temple was consolidated and the breaches in the wall were closed. Accumulated earth (sand dunes) inside the monument was cleared to expose the basal mouldings of the temple. Decayed wooden joints were restored.

229. KODANDARAMASVAMI TEMPLE, VONTIMITTA, DISTRICT CUDDAPAH.----Debris around the compound wall of the temple was cleared.

230. BHEEMESVARA TEMPLE, DRAKSHARAMA, DISTRICT EAST GODAVARI.—Leaking roofs of the temple and *mandapa* were reconcreted.

231. KANCHARAGUDI TEMPLE, BICCAVOLU, DISTRICT EAST GODAVARI.—Wide joints were filled and grouted with combination mortar and the mouldings were reset into position. A barbed wire fencing with an iron gate was provided around the temple (pl. LXXXIX).

232. VIRABHADRASVAMI TEMPLE, BICCAVOLU, DISTRICT EAST GODAVARI.—A barbed wire fencing was provided around the temple.

233. NAKKALAGUDI TEMPLE, BICCAVOLU, DISTRICT EAST GODAVARI.—Fallen and out-of-plumb mouldings of the walls and *sikhara* were restored by filling up the wide and deep joints. The monument was provided with a barbed wire fencing with an iron gate.

234. BHAVANARAYANASVAMI TEMPLE, BAPATLA, DISTRICT GUNTUR.—Plaster coats on the the *sikhara* were removed, and the *sikhara* mouldings were exposed. Pointing was done to the joints in the stone masonry of the *sikhara.* Relaying of the roof of the *maha-mandapa* was completed.

235. KAPOTESVARASVAMI TEMPLE, CHEJERLA, DISTRICT GUNTUR.—Dead plaster on the monument was removed and replastered with fine finish, matching the original. Stone flooring was relaid and underpinning was done to the inner *prakara* wall.

236. CHARMINAR, HYDERABAD, DISTRICT HYDERABAD.—Plastering of all the walls, pillars and parapet walls around the clock area was completed and the flooring was relaid with concrete. Restoration work of the floral designs in the parapet wall around the clock area with pendants, and also on pillars and arches of the balconies on the western and eastern sides between the clock and mosque area was completed.

237. GOLCONDA FORT, HYDERABAD, DISTRICT HYDERABAD.—In continuation of the last year's work *(1975-76,* p. 117), structural repairs including underpinning, watertightening and pointing to the walls, pillars, etc., of the dancing hall in Rani Mahal were completed. Open area in front of mosque in Akkanna Madanna offices and Nagarkhana in Balahisar was cleared and the debris was removed to expose ancient structures. Replastering the parapet wall of the citadel *(baradari),* after removing the decayed plaster, was completed. Roof of the top floor was watertightened with concrete. First floor and its surrounding structures in Rani Mahal were watertightened. Underpinning of the hollowed masonry was done wherever necessary.

Debris in the open area, between Bodyguard room and Silaikhana and Balahisar was removed and old platforms and floor levels were exposed. Debris on the rear side of Silaikhana and south of Taramati mosque in Balahisar was cleared to expose ancient structures. Similar work is in progress in other areas of Balahisar. Watertightening, underpinning and pointing of walls, pillars, arches, etc., are also in progress in large scale. Similar work is being done at the group of structures around Dewan-e-khas in Rani Mahal. Repairs to the Balahisar Darwaza was completed. The work of opening the archway and entrance to connect the new road behind Silaikhana with the old ramp is completed. The work of replastering of the frontage of main gate, main entrance arches and walls is in progress. Pointing work is in progress to the outer face of fortification-wall and the screen wall. The work of barricading the opening of Silaikhana and the frontage of Balahisar with designed iron frame is in progress.

238. KONDA REDDY BURZ, KURNOOL, DISTRICT KURNOOL.—Top storey of the burz was provided with hand railing and the flag staff was replastered. Providing of expanded metal grills in different frames to the arched openings on the northern side and fixing of iron framed shutters to the arched openings on the southern side of the Abdul Wahab Khan's tomb was completed. Refixing of the old iron-framed door with necessary repairs to the arched opening on the eastern side of the tomb was also completed. In continuation of the last year's work *(1975-76,* p. 117), the grouting of the cracks on the eastern dome of the tomb after the removal of dead plaster and also relaying of the extrados was completed.

239. KALYANAMANDAPA, UDAYAGIRI, DISTRICT NELLORE.—Barbed wire fencing was provided around the monument.

240. RANGANAYAKULA TEMPLE, UDAYAGIRI, DISTRICT NELLORE.—Debris inside the *gopura* was cleared and the basal mouldings of the *gopura* as well as the original flooring of the open courtyard were exposed.

241. RAMALINGESVARA TEMPLE, SATYAVOLU, DISTRICT PRAKASAM.—In continuation of the last year's work *(1975-76,* p. 118), raising of the height of the compound wall around the temple and pointing of the joints in the wall were completed.

242. CHOLA TEMPLE, MOTUPALLI, DISTRICT PRAKASAM.—The work of providing barbed wire fencing around the protected area is in progress.

243. THOUSAND PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.—Raising of the compound wall around the temple was completed.

244. ANCIENT MONUMENTS, FORT, WARANGAL, DISTRICT WARANGAL.—Providing of barbed wire fencing around Rama temple, Jagamayya temple, Svayambhuva temple, area around *torana* and Sitab Khan's Mahal was completed. The ancient mound around Sitab Khan's Mahal was cleared.

245. DHARMALINGESVARA AND ADJACENT CAVES, GUNTUPALLI, DISTRICT WEST GODAVARI.—White-wash and plaster accretions on the surface of the walls were removed and wide joints were grouted with liquid cement (pl. XC). A dwarf wall on the top of the caves was constructed. Disturbed stone courses of the votive *stupas* were fixed in their original positions. The brick masonry of the *stupa* was also reset and the top watertightened.

Karnataka

246. ROYAL HAMMAM, FORT, BIDAR, DISTRICT BIDAR.—The monument was provided with teak wood joists and ceiling planks and the roof relaid with concrete.

247. SOLAKAMBHA MOSQUE, FORT, BIDAR, DISTRICT BIDAR.—Water spouts to drain off rain water were provide to the mosque. Parapet wall was pointed and replastered. South-western wall of Lalbagh was restored.

248. GREAT MOSQUE, GULBARGA, DISTRICT GULBARGA.—Existing wooden frames of the monument were provided with expanded metal and the old metal frames were painted.

SOUTH-WESTERN CIRCLE

Goa

249. AGUODA FORT, CANDOLIM, GOA.—Repairs to the breaches in the fortification-wall were taken up on a large scale. Foundations of the bastions were strengthened at the time of low tide in the sea by using quick setting cement, and the masonry work was raised to a height of about 6 m.

Maharashtra

250. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—Rock-cut drain was provided in the floor of Cave 1, to drain out the surface water. To arrest further disintegration and erosion of rock along the pathway, a coat of cement plaster was applied and chiselled to match the surrounding. Modern U.C.R. masonry pillars in Cave 7 which were not conforming with the original, were dismantled and restored in R.C.C. along with the *mandapa* as per the original. The spongy rock over the facade of Caves 5, 17, 20 and 26 was chiselled and the facade portion was projected in R.C.C. so that rain water does not flow inside the caves.

251. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—Screen of the tomb, burj, *baradari,* etc., were replastered wherever necessary, conforming with the original, with fine shining plaster. Cornices of different structures were also repaired. Missing red stone *Jalies* of the fountains, serving as low parapet wall, were replaced with R.C.C. ones.

Debris in front of the Maqbara and on the western side was cleared, and the area was fenced for developing a garden around it. Debris around the British tombs in front of the Maqbara was cleared and iron gril was provided. Copper and brass plates in the main entrance gate were cleaned.

252. ROCK-CUT CAVES, AURANGABAD, DISTRICT AURANGABAD.—The work of cutting a rock-cut channel in the ceiling of Caves 3 and 6, joining the percolating points, is in progress. The dislodged hands of the sculpture of Buddha, sitting in *padmasana,* recovered while clearing the dabris on the eastern side of Cave 4, were restored by drilling holes and providing stain less steel pins.

253. FORT, DAULATABAD, DISTRICT AURANGABAD.—Missing stone pavement in the premises of the Bharatmata temple was restored. Steps and parapet wall all around the temple were repaired. Loose and fallen pillars were fixed to their original positions. Old wooden fort gates were repaired. Saraswati *bawadi* was desilted. Missing stone pillars, lintels, beams, etc., were restored in R.C.C., conforming to the original design, texture and colour. Collapsed portion of the inner fortification-wall was repaired.

254. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The work of providing access to the upper storey of Cave 4 was completed. Stone masonry pillars in Caves 19 and 20 were replaced by R.C.C. ones matching with the original.

255. SION FORT, BOMBAY, DISTRICT BOMBAY.—Compound wall with huge cracks was dismantled and reconstructed as per the original.

256. ELEPHANTA CAVES, CHARAPURI, DISTRICT KOLABA.—Missing beam in the eastern side of Cave 1 was restored to match with the original. The decayed and weathered portion of the walls, door-jambs, etc., of Cave 4 were restored in R.C.C. Missing pillars in Cave 6 were restored in R.C.C. as per the original plan and design, and a flight of steps was provided for the group of caves. Cracks and cavities in the caves were filled up to stop further deterioration. The work of providing terrace from Cave 1 to the visitor's pavilion was taken up to avoid further erosion of soil and to reclaim more land for the easy movement of the visitors.

257. JIJAMATA PALACE, PACHAD, DISTRICT KOLABA.—A large-scale debris clearance work was taken up. The collapsed palace fortification and gates were repaired and the cavities were filled with cement mortar and tops rendered watertight.

258. FORT, RAIGAD, DISTRICT KOLABA.—Rank vegetation and debris around the important structures in the premises of the fort were cleared. Cracks and cavities in the walls of the Bazarpet, Jagadishwar temple, Nagarkhana, Queen's palaces, etc., were filled with cement mortar and the tops rendered watertight. Approach paths to different monuments in the fort were provided.

259. PANHALA FORT, PANHALA, DISTRICT KOLHAPUR.—Area around the structures known as Ganga and Yamuna, was levelled up for laying a garden, and the decayed lime concrete of the terrace was removed and reconcreted.

260. GONDESHWAR TEMPLE, SINNAR, DISTRICT NASIK.—Cracked lintels, beams and roofing slabs of the eastern gate on the southern side of the temple were replaced with R.C.C. ones conforming to the original, and the top was rendered watertight by providing cement concrete over it. Area around the temple was levelled up after clearing the debris.

261. ROCK-CUT CAVES, BHAJA, DISTRICT PUNE.—A flight of steps from the foot of the caves was provided.

262. ROCK-CUT CAVES, KARLA, DISTRICT PUNE.—The compound wall extending from the cave to the main cave was constructed.

263. SHANWARWADA, PUNE, DISTRICT PUNE.—Decayed plaster on the walls and fountains of the Chimanbagh and Ganesh Rang Mahal was removed and replastered as per the original.

WESTERN CIRCLE

Gujarat

264. SARANGPUR GATE, AHMADABAD, DISTRICT AHMADABAD.—The dislodged and decayed ashlar masonry was dismantled and reconstructed as per the original. Vegetation and roots in the masonry were removed. The work of reconstructing the fallen and bulged brick wall on the northern side of the gate is in progress.

265. BAI HARIR'S VAV, ASARWA, AHMADABAD, DISTRICT AHMADABAD.—The bulged inner brick masonry core of the plinth was dismantled and reset. Ashlar masonry, matching with the original, was also provided (pi. XCI).

266. SMALL STONE MOSQUE, PALDI, AHMADABAD, DISTRICT AHMADABAD.—The outer core of the plinth on the north was provided with ashlar masonry matching with the original.

267. RAUZA OF SHAIKH AHMAD KHATTU GANJ BAKSH, SARKHEJ, DISTRICT AHMADABAD.—Repairs to the stone flooring in the verandah were carried out.

268. DARBARGARH, SIHOR, DISTRICT BHAVNAGAR.—The compound wall was repaired after removing the vegetation growth and thorny bushes. The roof was provided with Mangalore tiles.

269. TALAJA CAVES, TALAJA, DISTRICT BHAVNAGAR.—The area around the caves was cleared of thick vegetation growth. The excavation of the accumulated earth at the western slope of the hill exposed to view new caves. Steps were cut out of the rock on the slope of the hill to provide the paths.

270. RUKMINI TEMPLE, DWARKA, DISTRICT JAMNAGAR.—The damaged and decayed stones of the plinth were replaced by ornamented ashlar stones as per the original. Stone-paved flooring was laid in the *sabha-mandapa* and the *garbhagriha.* The work is in progress.

271. CITADEL WALL, CHAMPANER, DISTRICT PANCH MAHALS.—-The out of plumb and dangerously hanging ashlar facing stones were dismantled and reset. The vegetation growth over the wall was cleared.

272. LAKULISA TEMPLE, PAVAGARH, DISTRICT PANCH MAHALS.—The sculptures and the ashlar masonry of the *jangha* part of the temple were dismantled and reset after strengthening the foundation with cement concrete.

Rajasthan

273. ABDULLAH KHAN'S TOMB, AJMER, DISTRICT AJMER.—The height of the compound wall was raised and iron railing with gate was provided to prevent trespassing. The pathways were laid with lime concrete.

274. ADHAI-DIN-KA-JHOMPRA, AJMER, DISTRICT AJMER.—An apron of cement concrete was constructed for strengthening the foundation of the walls. Expanded metal frames were provided to the open verandah for the safety of the sculptures.

275. BADSHAH HAVELI, AJMER, DISTRICT AJMER.—The compound was provided with iron railing and gate to check the trespassing. The pathways were laid in lime concrete.

276. BEGAM ABDULLAH KHAN'S TOMB, AJMER, DISTRICT AJMER.—The height of the compound wall was raised and iron railing with gate was provided to stop free entry. The path ways were provided with lime concrete.

277. BADSHAHI MAHAL, PUSHKAR, DISTRICT AJMER.—The embankment of the Pushkar lake was strengthened with bags filled with stone and sand to prevent water entering into the monument.

278. NILKANTHA MAHADEVA TEMPLE, ARTHUNA, DISTRICT BANSWARA.—The decayed, hanging and out of plumb ashlar stone masonry of the dome of the *sabha-mandapa* were care fully taken down; the work of reconstructing the same is in progress.

279. SIVA TEMPLE 2, ARTHUNA, DISTRICT BANSWARA.—The debris around the monument was removed to expose the hidden plinth. Fallen and hanging stone masonry of the dome of *sabha-mandapa* was dismantled and reconstructed as per the original.

280. MANDAKINI KUND, BIJOLIA, DISTRICT BHILWARA.—The sunken stone pavement was removed and reset, and missing stones were replaced by new ones.

281. UNDESHWAR MAHADEVA TEMPLE, BIJOLIA, DISTRICT BHILWARA.—The work of removing the sunken stone flooring, resetting them over a cement concrete cushion and replacing the broken stones with new ones is in progress.

282. GROUP OF MONUMENTS, FORT, CHITTAURGARH, DISTRICT CHITTAURGARH.—The work of resetting the bulged and uneven ashlar stone masonry was carried out at Bhimlat tank, Khatan Vav, Tel-ki-Bavdi and Surya Kund, besides clearing the debris and the vegeta tion growth.

Replacing of the broken slabs of the roof and providing them with cement concrete was completed at Badi Pol.

The work of reconstructing the stone masonry, changing of the broken slabs of the roof and watertightening with fresh cement concrete was completed at Tripolia gate.

The bulged and out of plumb ashlar masonry of the Rana Kumbha's palace was dismantled and reconstructed as per the original. Missing stones of the *chhajja* and the pavement were replaced and conditioned.

The work of replacing the missing lintels and stones of the flooring, providing of steps, underpinning and pointing of the joints in the walls, was carried out at the palace of Fatta. Resetting the out of plumb ashlar stone masonry, ubderpinning and pointing the joints in the walls were carried out at the Padmini palace. Besides, window-openings on the lake side were provided with iron grills.

The works executed at Rampura house consisted of resetting of the missing ashlar stone masonry, reconstruction of the collapsed R. R. masonry and laying of fresh concrete, underpinning and plastering of the walls.

The vegetation growth and debris were cleared and the dislodged stones of the *sikhara* and the *sabha-mandapa* of the Siva temple in the nursery were reset. The damaged flooring was removed and new flooring on concrete cushion was relaid.

283. BHATNER FORT, HANUMANGARH, DISTRICT BIKANER.—The bulged portions of the brick masonry of the bastions 6 and 7 of the fort and the wall in between were dismantled and reconstructed as per the original.

284. JAGAT SHIROMINI TEMPLE, AMBER, DISTRICT JAIPUR.—The fallen boundary wall in R. R. masonry was reconstructed and plastered with cement, after removing the debris.

285. JAIGARH FORT, AMBER, DISTRICT JAIPUR.—The excavated trenches and drilled portions throughout the fort were filled up and made good with cement concrete as per the original.

286. PUNDARIKJI-KI-HAVELI, JAIPUR, DISTRICT JAIPUR.—Three coats of bitumen were applied over the roof to prevent leakage of rain water.

287. GROUP OF MONUMENTS, FORT, KUMBHALGARH, DISTRICT UDAIPUR.—The dome of the *sabha-mandapa* of the central shrine of Bavan Deori temple was rendered watertight with cement concrete after the removal of dead concrete and filling the cracks with cement mortar and waterproofing compound.

Loose architectural members in the *sabha-mandapa* of the Golerao temple 5 were reset as per the original. Damaged ashlar stone masonry of the dome was dismantled and the work of reconstructing and watertightening with fresh cement concrete is in progress.

Resetting of the out-of-plumb R. R. masonry of the stair cabin wall and parapet wall, replacing the decayed wooden beams over the gate and planks in the ceiling by new ones and giving two coats of paints with wood preservative, were carried out.

In the Jaina Temple 3, coarse stone masonry was provided in the roof of the dome.

At Hanuman Pol stone pavement of the platform was repaired. Besides, two coats of paints with wood preservative were applied on the wooden doors.

Dislodged stone masonry of Prithvi Raj palace was reset, and the walls were plastered with fresh cement concrete. Two coats of wood preservative were applied on the doors and beams.

MONUMENTS MAINTAINED BY THE STATES

ANDHRA PRADESH

Conservation work was executed at the following monuments :

1. QUTB SHAHI TOMBS, GOLCONDA, DISTRICT HYDERABAD.

2. FORT, DEVARAKONDA, DISTRICT NALGONDA.

3. SOMESVARASVAMI TEMPLE, KULPAK, DISTRICT NALGONDA.

4. MONOLITHIC PILLAR, NALGONDA, DISTRICT NALGONDA.

5. PLLLALAMARRI TEMPLES, NALGONDA, DISTRICT NALGONDA.

ASSAM

Conservation work was carried out at the following monuments :

6. SIVA TEMPLE, SONAI, DISTRICT CACHAR.

7. GANESH MANDIR RUINS, ABHAIPURI, DISTRICT GOALPARA.

8. MADAN-KAMDEV RUINS, BAIHATA CHARIALI, DISTRICT KAMRUP.

9. MAGHNOWA TEMPLE, PADMAPUR, DISTRICT LAKHIMPUR.

GUJARAT

Conservation work was carried out at the following monuments:

10. NAVALAKHA TEMPLE, GHUMLI, DISTRICT JAMNAGAR.

11. LAKHOTA KOTHA, JAMNAGAR, DISTRICT JAMNAGAR.

12. GROUP OF TEMPLES, BHANASRA, DISTRICT JUNAGADH.
13. ADI-KADI VAV, JUNAGADH, DISTRICT JUNAGADH.
14. KOTHAR (UPARKOT), JUNAGADH, DISTRICT JUNAGADH.
15. NAVAGAHAN KUVO, JUNAGADH, DISTRICT JUNAGADH.
16. NILAM TOP, JUNAGADH, DISTRICT JUNAGADH.
17. HOUSE OF SRIMATI KASTURBA, PORBANDAR, DISTRICT JUNAGADH.
18. NAGARA MOUND, PRABHAS PATAN, DISTRICT JUNAGADH.
19. THUNTHIA VAV, MAHEMADABAD, DISTRICT KHEDA.
20. SHIV TEMPLE, KERA, DISTRICT KUTCH.
21. OLD STEP-WELL, MODHERA, DISTRICT MAHESANA.
22. RAYADI MASJID, MODHERA, DISTRICT MAHESANA.
23. GROUP OF TEMPLES, KANKANPUR, DISTRICT PANCH MAHALS.
24. VANAJHARI VAV, KANKANPUR, DISTRICT PANCH MAHALS.
25. GROUP OF MONUMENTS, LAV ANA, DISTRICT PANCH MAHALS.
26. KALESHWAR MONUMENTS, LAVANA, DISTRICT PANCH MAHALS.
27. TEMPLE WITH GHUMAT, LAVANA, DISTRICT PANCH MAHALS.
28. GEBALSHA-NI-VAV, PAVAGADH, DISTRICT PANCH MAHALS.
29. GROUP OF MONUMENTS, SANT, DISTRICT PANCH MAHALS.
30. KUND, ABHAPUR, DISTRICT SABAR KANTHA.
31. SHIV TEMPLE, ABHAPUR, DISTRICT SABAR KANTHA.
32. VIDYADHAR-NI-VAV, SEVASI, DISTRICT VADODARA.

KARNATAKA

Conservation work was carried out at the following monuments :

33. VENKATARAMANASVAMI TEMPLE, BANGALORE, DISTRICT BANGALORE.
34. RAMADEVARU TEMPLE, KUDLUR, DISTRICT BANGALORE.

35. CHENNAKESAVA TEMPLE, MARLE, DISTRICT CHIKMAGALUR.

36. SIDDESVARA TEMPLE, MARLE, DISTRICT CHIKMAGALUR.

37. YOGANARASIMHA TEMPLE, HASSAN, DISTRICT HASSAN.

38. TRIKUTA BASTI, CHIKHANASOGE, DISTRICT MYSORE.

39. CHENNAKESAVA TEMPLE, DHARMAPURA, DISTRICT MYSORE.

40. JAIN BASTI, YAMAGUMBA, DISTRICT MYSORE.

41. LAKSHMINARASIMHASVAMI TEMPLE, BHADRAVATI, DISTRICT SHIMOGA.

ORISSA Conservation work

was carried out at the following monuments:

42. INDRALATH TEMPLE, RANIPURJHARIAL, DISTRICT BOLANGIR..

43. BUDDHALINGA TEMPLE, CHAUDWAR, DISTRICT CUTTACK.

44. PANCHAPANDAVA TEMPLE, DHANISHA, DISTRICT CUTTACK.

45. TRILOCHANESVAR TEMPLE, KUNDESWAR, DISTRICT CUTTACK.

46. KANAKESVAR GROUP OF TEMPLES, KUALO, DISTRICT DHENKANAL.

47. PATALESVAR TEMPLE, BUDHIKOMNA, DISTRICT KALAHANDI.

48. MALLIKESVAR TEMPLE, PADMAPUR, DISTRICT KORAPUT.

49. PATALESVAR TEMPLE, PAIKAPADA, DISTRICT KORAPUT.

50. CHANDESVAR TEMPLE, CHANDESWAR, DISTRICT PURL

51. LAKSHMINARAYANA TEMPLE, CHAURASI, DISTRICT PURL

PUNJAB

52. MUGHAL SARAI, DORAHA, DISTRICT PATIALA.—Vegetation growth and trees were removed and the area was cleared of debris.

53. MUGHAL SARAI, SHAMBA, DISTRICT PATIALA.—The roof of the monument was water-tightened and two damaged walls were repaired. Cracks and joints in the walls were pointed and the damaged plaster of the front gate and parapet was removed and replastered. Vegetation growth and trees were removed and the debris was cleared.

54. AM-KHAS BAGH, SIRHIND, DISTRICT PATIALA.—The monument was cleared of vegeta tion growth and debris, thus exposing the so far hidden portions. The damaged portions of the monument were restored.

55. QILA ANDUROON, PATIALA, DISTRICT PATIALA.—-Vegetation growth and debris were removed. Roofs were watertightened and the flooring was reconditioned. Damaged decorative plaster was repaired and redone wherever necessary. Stone *jalies* and carvings on the doors were chemically cleaned. Cracks on the walls were filled with lime mortar.

56. SHEESH MAHAL, PATIALA, DISTRICT PATIALA.—All the monuments in the complex were conserved and restored to their original look.

UTTAR PRADESH

57. TOMB AND SAMADHI OF SANT KABIR, MAGHAR, DISTRICT BASTI.—Minor repairs were carried out to the monuments besides maintaining and improving the garden.

58. RANI LAKSHMI BAI TEMPLE, JHANSI, DISTRICT JHANSI- -Conservation works such as edging, pointing, cement plastering and reconstruction of the dilapidated portions of the monument were carried out.

59. BALMIKI ASHRAM, BITHOOR, DISTRICT KANPUR.—Minor repairs were carried out to the monument besides laying out a garden around it.

WEST BENGAL

60. OCTAGONAL SIVA TEMPLE, SUPUR, DISTRICT BIRBHUM.—The platform was relaid in beaten lime mortar, and measures were taken to protect the plinth. The false doors were repaired. The flooring of the main sanctum was relaid. The vegetation growth on the roof of the temple was removed by chemicals. The terracotta plaques were thoroughly cleaned and given preservative coat. The adjoining area of the temple was dressed and levelled. The site was fenced with twisted wire.

61. THREE SIVA TEMPLES, SRIBATI, DISTRICT BURDWAN.—The high platforms were relaid with mortar as per the original. The fallen wall around the shrines was rebuilt, providing one iron gate at the main entrance. The courtyard of the group was paved with brick-on-edge and joints pointed with composite mortar. Trees and plants on the roof of the monuments were eradicated. Terracotta plaques and mouldings were treated with chemicals and were carefully applied with a suitable preservative. The land adjoining the main temple was dressed for laying out a garden. A drain was constructed for draining out the storm water.

Besides, conservation work is in progress in the following monuments:

62. OCTAGONAL GOURANGA TEMPLE, HAT-TALA, DISTRICT BIRBHUM.

63. SIVA TEMPLE, PANCHRA, DISTRICT BIRBHUM.

64. SIVA TEMPLE, RASA, DISTRICT BIRBHUM.

65. GOURCHANDRA AND KRISHNACHANDRA TEMPLES, CHATRA, DISTRICT HOOGHLY.

66. RADHAGOVINDA AND RADHARAMAN TEMPLES, GOVINDANAGAR, DISTRICT MIDNAPORE.

67. RATNESVARA SIVA TEMPLE, BILBARI, DISTRICT MURSHIDABAD.

IX. EXPEDITION OUTSIDE INDIA

PRESERVATION ON BUDDHIST SHRINES AT BAMIYAN AND A TIMURID SHRINE AT BALKH IN AFGHANISTAN

THE BIG BUDDHA AT BAMIYAN

Structural preservation.—In continuation of the previous year's work *(1975-76,* pp. 127-128), the joint Indo-Afghan project under the leadership of Shri R. Sengupta made further progress in the preservation of the rock-cut image of the Big Buddha. The cracked portion above the right knee of the image was strengthened by rock-bolting and grouting.

All the shrines around the principal niche at the ground level were repaired (pl. XCII) while the approach to the cave at a higher level which lies above the newly-built wall on the east was made good by filling in the cavities with rubble packing in cement mortar.

Two wooden platforms were erected on either side of the Big Buddha's head to facilitate chemical cleaning of the murals.

Chemical preservation[1].—The chemical conservation of the fragmentary painted surface in the cells of the Buddha on the ground floor was continued during the period under review. The smoke, bitumen, dust, etc., lying on the plaster was removed in the various cells but no coherent outline of the murals could be made out. On the contrary, the stucco figures decorating the friezes in the cells were brought out in great detail, the outline being quite sharp, after the removal of the black accretion deposited on them. Some of the stucco figures represent *Kirti-mukhas.*

On the drapery of image of Buddha was uncovered bright red painting, this pigment being formerly hidden under the thick dusty accretion that had collected on the image. Wherever the accretion has been removed the luster and colour of the folds of the drapery have come out nicely.

THE SHRINE OF KHWAJA ABU NASAR PARSA AT BALKH

Structural preservation.—Repairs to the shrine which was undertaken last year *(1975-76,* p. 128) under a bilateral agreement with Afghanistan and India were completed and handed over formally to the authorities of the former Government.

In the course of the preservation work fresh pointing to the extant brick-work was attended to in lime cement mortar, after raking out the joints. Walls of the two bastions at the rear were set in plumb and roof made watertight. Further, brick flooring of the underground cellar and the front aisle was provided, and a closed underground drain was constructed to drain out the rain water from inside the porch.

The extant dome, which was damaged, was preserved suitably. Significantly the ribbed main dome was covered originally with glazed blue tiles. When the shrine was taken up for repairs most of its tiles had fallen down from the dome (pl. XCIII A) and hence, there was no other alternative but to renew the tiled surface for making it watertight. For this purpose new tiles of the same size and colour were got prepared at Mazar-e-Shariff in the traditional way. However, the old tiles wherever in fair state of preservation were reused. Fluted ribs of the main dome was built in typical Timurid style with ribs following the original indication and curvature; and this could be achieved by preparing their plaster moulds (pl. XGIII B-D) on

[1]Information from the Chief Archaeological Chemist of the Survey.

which were cast tiles in panels of convenient lengths in *gutch* (gypsum). Care was taken to break the horizontal joints of each course of the panel of tiles. After setting these panels they were fixed on to the dome with *gutch,* rib after rib, from the stalectite base to the top. The hollow portions underneath were filled in with brick-bats and *gutch* after fixing of these panels. When the retiling of the entire dome was over, the entire surface was cleaned thoroughly to remove patches of mortar and a coat of chemical preservative was applied. It seems in earlier repairs animal fat was used to make the surface and the rib joints water-repellant.

X. ARCHAEOLOGICAL CHEMISTRY^

ANDHRA PRADESH

1. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—The sculptures in *natya-mandapa, ardha-mandapa, kalyana-mandapa* and the exterior walls were found covered with black dried up moss, white and grey patches of lichen and brownish accretions. While the vegetational growth was removed with the help of ammonia and teepol, the ferruginous brownish patches were reduced by chemico-mechanical means. Chemical treatment restored to the stone its original colour with the result several details were brought out.

The wall-paintings in the verandah, *ranga-mandapa* and *sayana-griha,* which were covered with cob-webs, insect-nests, cocoons, dust, dirt and smoke, formed due to burning of camphor and lighting of oil lamps, were also chemically cleaned. It was found that the old preservative, though darkened, had protected the paintings and prevented direct absorption of tarry and oily matter. The paintings were treated, using various organic solvents, individually and in combinations, to remove the accretions. The surface, after cleaning, shows some very fine murals of Vijayanagara style in clear shades of pigments.

2. THOUSAND PILLARED TEMPLE, HANAMKONDA, DISTRICT WARANGAL.—In continuation of the last year's work *(1975-76,* p. 129), the intricately carved external walls of Siva, Vishnu (pl. XCIV) and Suryanarayana shrines which were covered with buff coloured accretions, and the interior of these shrines which were covered with soot and oil, were cleaned with the help of emulsifying chemicals. The cleaned surfaces thereafter were polished with a wax based composition while the rest of the area was preserved with coats of poly vinyl acetate.

3. RAMAPPA TEMPLE, PALAMPET, DISTRICT WARANGAL.—The profusely carved parapet walls of the *maha-mandapa,* which were covered with a thick coat of lime wash and a greyish composite adherent accretion, and the exterior walls of the sanctum which had thick growth of moss and patches of lichens, were cleaned with the help of aqueous detergents, chemicals and organic solvents. The work is in progress.

BIHAR

4. SARAI MOUND, NALANDA, DISTRICT NALANDA.—The paintings, recently discovered on the stone pedestal of a Buddha figure in Sarai mound, belonging to the Pala school, depicting human and animal figures in red and black, were found executed on a very thin lime plaster which had become flaky due to the absorption of salts while buried in the soil. The flaky pigments and plaster were consolidated with the help of ! per cent polyvinyl acetate in toluene before cleaning. Mud and dust were removed with the help of soft brushes The other accretions on the paintings were removed with the help of acetone, ethyl alcohol, ethylene glycol-mono-ethyl ether and other solvents. The loose edges and fragile areas of the painted layer were also consolidated by strengthening the corners of plaster with the help of 10 per cent poly vinyl acetate solution. The paintings after cleaning were preserved with 1 per cent polyvinyl acetate solution in toluene.

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[1]Information from the Chief Archaeological Chemist of the Survey, except items 41-43, which are from the Director of Archaeology, Government of West Bengal.

DELHI

5. MARBLE SCREEN AND SURFACE, RANG-MAHAL, RED FORT, DELHI.—The marble screen which had been covered with dirty stains and a greasy deposit, was cleaned with hydrogen peroxide, alcohols, amylacetate and dioxen. Several detergents like lessapol and teepol B-300 were used for removing the dirt. Pyritic stains were reduced with the help of oxalic acid. The work is in progress.

6. ARAB-KI-SARAI, NIZAMUDDIN, NEW DELHI.—The paintings on the exterior walls of Arab-ki-Sarai which had been covered with dried up moss and lichens, dust, dirt and smoke were cleaned with the help of organic solvents and other mixtures. After drying, the surface was preserved with a coat of 3 per cent polyvinyl acetate solution in toluene. Besides, the paintings in the interior were partly cleaned with the help of mixtures of organic solvents like methyl and ethyl alcohols, esters and amines. Thus, several figures hitherto hidden under the accretion have been exposed. Mineral accretion on other areas has not responded to the effects of the organic -chemicals. Further experiments are, therefore, in progress.

HIMACHAL PRADESH

7. DUWANG GOMPHA, TABO, DISTRICT LAHUL AND SPITI.—In continuation of the last year's *(1975-76,* pp. 129-130) work, a team of chemists, modellers and other technical staff of the Survey carried out work of preservation of the paintings in the gomphas. The paintings which were covered with sooty and oily accretions in Gokhang were cleaned, and thereafter were preserved with 2 per cent polyvinyl acetate solution to arrest flaking of pigments. The paintings in Duwang Gompha which were covered with mud streaks were also cleaned properly, and the decolourisation caused by flow of humus laden water was reduced as far as possible. The cloth paintings on the ceiling which were detaching at several places were refixed to the wooden ceiling with adhesives and thereafter cleaned and preserved.

The walls of the gomphas had developed several big and small cracks due to several recent earthquakes in the region. Some painted mud plaster had detached from the mud-wall support. While these cracks were filled with the help of plaster of Paris mixed with adhesives, the small cracks were filled with adhesives only. The broken edges of the mud plaster were repaired by filleting the corners. The loose and detached plaster was fixed back to the wall-surface with the help of plaster of Paris. Small voids and gaps were filled and tinted with suitable earth colours to match the painted surface.

The famous statue of Thujen Thop (Vajrapani) in Duwang Gompha which had collapsed and broken into several pieces, was re-erected by piecing together the available fragments. The missing parts were modelled in plaster of Paris and Movicol and fixed in position. The statue now stands in its original beauty and splendour.

The big sitting statue of Chamba Chibo in Chamba Chibo Gompha had developed cracks on the neck and shoulder and the right hand had been provided with wooden support to prevent it from falling. This support was removed after strengthening the shoulder joint, palm joint and neck portion. Now, the whole statue has been fixed to the wall with hidden iron bars to prevent it from falling.

Several other statues in the Duwang Gompha which had developed cracks and were in danger of falling were also strengthened properly by providing hidden wooden and plaster supports to minimise the damage in the event of future tremors.

JAMMU AND KASHMIR

8. SHEESH-MAHAL, RAMNAGAR, DISTRICT UDHAMPUR.—The paintings on the walls of the

palace which were covered with thick coats of dust, dirt and mud streaks, formed due to flow of water on the painted walls, were cleaned with the help of organic solvents. The streaks of mud were reduced with dilute solution of liquor ammonia in methylated spirit. The colours used in painting were not adherent and run easily. Turpentine oil was, therefore, used to restrain the action of solvents.

KARNATAKA

9. TIPU SULTAN'S PALACE, BANGALORE, DISTRICT BANGALORE.—The work of chemical treatment and preservation of the paintings in the enclosures on the north-west and north-east and south-west and south-east, and antechamber in the west on the ground floor, includes consolidation of loose paint film and removal of lime-wash, greasy matter, soot and old varnish coats. A fresh coat of preservative was applied after cleaning.

10. CHENNAKESAVA TEMPLE, BELUR, DISTRICT HASSAN.—The chemical treatment of the intricate carvings and sculptures in the exterior and interior of the main temple and in *sukhanasi* was continued and completed. The thick accretions of oil, soot, etc., from oil lamps and burning of camphor, and vegetational growth were removed with the help of teepol and ammonia. The whole temple is preserved with a coat of 3 per cent polyvinyl acetate in toluene.

11. CHENNAKESAVA AND NAGESVAR TEMPLES, MOSALE, DISTRICT HASSAN.—The temples which were extensively covered with algal growth, coatings of lime at several places with sculptured surface showing extensive exfoliation, were taken up for chemical treatment.

KERALA

12. SIVA TEMPLE, TIRUVANJIKULAM, DISTRICT TRICHUR.—Chemical treatment for the removal of old darkened preservatives, soot and tarry matter, which had disfigured the paintings around the Palliyara and Sakti Panchakshani shrines was initiated. The work also involved the filling and filleting of a longitudinal crack, developed in the centre of the panel on the northern wall of the Palliyara shrine.

13. VADAKKUNATHAN TEMPLE, TRICHUR, DISTRICT TRICHUR.—The famous wooden carvings in Vadakkunathan, Rama and Sankaranarayana *mandapas,* which were covered with dust, dirt, thick accretion of soot and a hardened oily layer, were cleaned with the help of organic solvents and their mixtures, and thus making the carvings visible in full sharpness of outline and with their original mellowed lustre.

MADHYA PRADESH

14. SHAHI HAMMAN, BURHANPUR, DISTRICT BURHANPUR.—The beautiful paintings in floral and geometrical designs, executed on lime plaster, were covered with dust, dirt and bird droppings. These accretions were removed with the help of organic solvents like ethyl alcohol, acetone morpholine, butyl lactate and amyl acetate. The painted plaster, found peeling off or bulging out from the wall surface, was fixed back to wall support with the help of an adhesive mixture, using plaster of Paris and Fevicol in a proportion of 4:1.

15. PARSVANATH TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—In continuation of the last year's *(1975-76,* p. 131) work, the temple, found covered with moss and lichens, coats of

lime mortar and lime wash and affected by soluble salts, was subjected to chemical treatment. The black patches of moss and lichen were removed with ammonia solution, while the lime mortar was removed by mechanical means, using hard wooden chisels. Lime wash was cleaned with.l per cent acetic acid solution. The soluble salts were extracted by repeated treatment with paper pulp. A solution of 1 per cent zinc silicofluoride was used as a fungicide. The treated area was preserved with 2 per cent polyvinyl acetate in toluene.

16. BAGH CAVES, BAGH DISTRICT DHAR.—The accretions such as thick layers of dung, lime wash, bird's droppings, etc., on Panel 2 in Cave 2, were removed with sustained experimentation, exposing hitherto unknown paintings of floral designs in several colours. The accretions such as old and darkened varnish and sooty layers, covering the paintings in the porch of Cave 3, were removed with the help of organic solvents like methyl and ethyl alcohols, esters and ethers. About 1 sq m area was cleaned and preserved with a coat of polyvinyl acetate in toluene. The fungus growth over the paintings on the eastern wall in the Cave 4 was treated with thymol in alcohol. Mould growth was also observed on these paintings due to high humidity in the cave.

The loose and detached painted plaster on the ceiling of north aisle in Cave 2 was fixed back to the wall surface and the edges of the broken plaster were strengthened by filleting. The holes, made by the boring insects in the painted plaster in Cave 3 were disinfested with the help of formalin and then filled with plaster of Paris mixed with a synthetic resin and a few drops of insecticide like D.D.V.P. The flaking paintings in Cave 4 were fixed back with proper adhesive, after experimenting with several adhesives, suitable to the dampened cave surface. On the facade of the cave, a patch of plaster was found detaching from the surface of the wall. This patch was stripped from the wall-surface and strengthened.

All the cells of Cave 5 were given insecticidal treatment with formalin mixed with D.D.V.P. to prevent breeding of insects. Fumigation with cellphos and then with agrofine was carried out in Cave 3 to kill the insects and bats. These phosphorus chemicals were tried since other fumigants had proved ineffective.

The sculptures on the west wall of Cave 2 were covered with dust, dirt, bird droppings, smoke, etc. and were crumbling due to salt efflorescences. The sculptures were first washed with ammoniacal water and teepol. For removal of salt, repeated extraction with paper pulp was carried out. The sculptures were consolidated with a solution of polyvinyl acetate in toluene after cleaning.

17. STUPA 2, SANCHI, DISTRICT RAISEN.—The carved and sculptured portions of the railing of *Stupa* 2, which had become covered with thick moss and patches of many varieties of lichens, were cleaned with the help of 1 per cent ammoniacal solution in water. As an experimental measure, a coat of fungicide 2'4 D salt, a harmone composition, was applied on the surface to retard the biological growth. The surface was then treated with a preservative coat. The efficacy of the harmone derivative is under study. The work is in progress.

18. BHIMA-GAJA PILLAR AND SIVA TEMPLE, BADO PATHARI, DISTRICT VIDISHA.—The black moss and tufts of lichens, covering the pillar and the temple were removed with the help of ammoniacal water. A fungicidal treatment was then given. A preservative coat of 2 per cent polyvinyl acetate was applied on the surface.

19. UDAIGIRI CAVES, UDAIGIRI, DISTRICT VIDISHA.—The sculptures in the caves which had become covered with moss and grey-and-white patches of lichen were cleaned with the help of ammoniacal solution using fine nylon brushes. After removal of the algal growth, the sculptures were given a fungicidal coat and preserved with a coat of 2 per cent polyvinyl acetate solution.

20. HELIODOROS PILLAR, BESNAGAR, DISTRICT VIDISHA.—The pillar which had become covered with black patches of dried moss and coat of lime-wash at several places was cleaned with the help of ammoniacal solutions. The lime-wash was removed by using 1 per cent acetic acid solution in water. After washing thoroughly with salt-free water, it was preserved with synthetic resin.

MAHARASHTRA

21. EXCAVATED REMAINS, DAIMABAD, DISTRICT AHMADNAGAR.—The excavated remains were preserved with polyvinyl acetate solution, after proper cleaning. The skeleton excavated from the site was cleaned with the help of solvents and thereafter consolidated with preservative coat.

22. AJANTA CAVES, AJANTA, DISTRICT AURANGABAD.—In Cave 17, removal of discoloured and hardened resins, sooty matter, dust, etc., adhering to the paintings on the northern wall of the north aisle, was done. The treatment of paintings posed several intricate problems. The portions near the ceiling had been covered with hard coatings of varnish showing a thick layer of white mineral accretion, hiding all details of the paintings. For removing the hardened varnish and other accretions, organic solvent with varying solvent power, such as acetone, butyl acetate, butyl lactate, triethanolamine, dimethyl formamide, morpholine, cyclohexylamine, were used in different proportions. Some of these have a disruptive effect on the varnish. Incrustations which did not respond to the action of these solvents and their mixtures were treated with a solution of formic acid in alcohol. After cleaning, details of paintings became visible in their true tones. About 12 sq m area has been treated of which a part was given a coat of 1 percent polyvinyl acetate solution. This area is under observation for assessing the optical quality of the synthetic resin layer.

In Cave 6, the ceiling of Buddha Chamber on the ground floor showed a thick deposit of sooty and oily incrustation, obscuring the paintings underneath. These deposits were removed with the help of organic solvents, thus exposing beautiful floral and geometrical designs in various colours. The work of exposing the hidden paintings on the walls is in progress (pl. XCV). The bulged portions of the painted plaster were fixed to the ground by using adhesives. All broken edges were repaired by filleting with plaster of Paris, suitably tinted with earth colours. In Cave 10, the strengthening of painted plaster and broken edges of paintings on fourteen pillars was carried out by filleting.

In Cave 4, the exhibited copies of some of the paintings were found to be attacked and damaged by the insects, which were eradicated by spraying pyrethrum and D.D.V.P. solution mixed in pine oil. Sachets containing paradichlorobenzene were placed behind panels to minimize breeding of the insects. The extermination of insects was also carried out in the cells of Caves 1, 2, 16 and 17 by spraying pyrethrum mixed with D.D.V.P. diluted to the required proportion.

The fine dust, collecting on the surface of paintings, was regularly taken off with the help of soft feather brushes and fine muslin cloth. The dust not only absorbs chemicals from the the atmosphere but also dulls the colours of the pigments.

Recording of temperature and relative humidity inside and outside the important caves is being carried out three times a day. In addition, continuous recording was also carried out with the help of thermo and hygrographs at regular intervals, to understand the movements of moisture in the walls and determining the water content in the rock and plaster.

23. MARBLE SCREEN, BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—The marble screen around the cenotaph was covered with dirt, dust, grease, sooty and oily patches with the result the surface had become stained to a yellowish tint. The smoky and oily patches,

dust and dirt were removed with the help of ammonia and emulsifier solutions. The yellow stains were reduced with the help of a dilute solution of hydrogen peroxide and alcohol.

24. ELLORA CAVES, ELLORA, DISTRICT AURANGABAD.—The sculptures in Cave 6 were found covered with thick vegetation growth, dust and dirt. Eradication of these accretions was continued. During the execution of work, the paintings of the eighteenth century were protected from wash-waters with polythene sheets. In addition, the *vimanas,* top of *sabha-mandapa* and *nandi-mandapa* were chemically cleaned by using 5 per cent solution of ammonia in 2 per cent teepol solution. A coat of zinc silicofluoride was applied as fungicide to reduce such growth in future. The surfaces were then preserved with a coat of 3 per cent solution of polyvinyl acetate in toluene.

The paintings (pl. XCVI) on the lintel of the entrance to the southern porch of Kailasa temple were covered with thick dark coats of shellac varnish. These accretions were removed with the help of organic solvents, which resulted in exposing a painting of Nataraja in full details.

The accretions such as soot, dust and charcoal marks, covering the paintings in the south-eastern portion of the porch of Lankesvara, were successfully removed with the help of solvents like triethanolamine, cellosolve, butyl lactate, alcohol, etc. The loose and detaching big chunks of painted plaster in the ceiling of the porch were fixed back to the rock surface with plaster of Paris, suitably tinted with colour and a strong solution of polyvinyl acetate.

25. ELEPHANTA CAVES, ELEPHANTA, DISTRICT BOMBAY SUBURBAN.—In continuation of the last year's *(1975-76,* p. 133) work, the massive sculptures affected by soluble salts, resulting in much exfoliation of the stone layers and covered with dust, dirt, bird droppings and cinnabar, were chemically treated. The friable sculptures affected with soluble salts were given paper pulp treatment to extract the salts. The stone surface was cleaned of dust, dirt and other accretions, using a 2 per cent teepol solution. The whitish accretions of lime, cement, bird droppings, etc., were cleaned with 1 per cent acetic acid solution and then thoroughly washed with salt free water. The cleaned areas were preserved with polyvinyl acetate solution. Consoli dation and filling of gaps was carried out with the help of epoxy resins.

ORISSA

26. ANANTA BASUDEV TEMPLE, BHUBANESWAR, DISTRICT PURI.—In continuation of the last year's *(1975-76,* p. 133) work, the salt affected sculptures on the lower portion of *deul* and the vertical walls of *jagamohana* were treated for the removal of soluble salts. Paper pulp was repeatedly applied on the deteriorating sculptures to extract the salts as far as possible. After ensuring that the soluble salt has been removed, the surface of the stones were preserved with 2 per cent polyvinyl acetate solution in toluene.

27. CHITRAKARINI TEMPLE, BHUBANESWAR, DISTRICT PURI.—A number of slabs of Atgarh sandstone of the temple had reached an advanced stage of decay. The cleaning, therefore, had to be carried out very carefully with large quantities of ammoniacal water and with the help of soft brushes. The moss growth on all four sides of *jagamohana* was also removed. The subsidiary shrines on north-eastern and north-western sides were also treated with paper pulp. After clean ing these shrines, the sculptures were consolidated with 3 per cent polyvinyl acetate solution in toluene.

28. MARKANDESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The moss and lichen growth on the temple were removed and after cleaning, the surface was treated with 1 per cent polyvinyl acetate in toluene for consolidation.

29. MEGHESWARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The algal growth on the eastern side of the *Jagamohana* was removed with the help of 2 per cent ammoniacal solution. The work is in progress.

30. SUN TEMPLE, KONARAK, DISTRICT PURI.—The chemical treatment of the highly ornate plinth was started from the eastern side and continued upto the southern portion. The area which was covered with a penetrating growth of moss and patches of lichens was cleaned with the help of ammoniacal water. The friable stones on the southern side of the plinth were subjected to repeated treatments with paper pulp to render the stone surface free from the injurious crystalline salts. Fungicidal treatment and application of a preservative coat was carried out on the vertical walls of the eastern and southern face. The sculpture of Sun in the niche facing south was cleaned with the help of 1 per cent oxalic acid for removing rust stains caused by an iron beam in the lintel above. The sculpture was given coat of preservative having 0*5 per cent polyvinyl acetate solution in toluene.

31. LAKSHMI TEMPLE, JAGANNATHA TEMPLE-COMPLEX, PURI, DISTRICT PURI.—The coloured cement coats over the carvings and relief of the walls of the temple were removed using 2 per cent acetic acid solution in water". The exterior surface of the walls and pillars of *bhoga-mandapa* and *natamandira* on the northern side were again cleaned with acetic acid to remove the stubborn lime layer at several places. The surface of the temple was then coated with 2 per cent methyl methacrylate solution in toluene as preservative.

RAJASTHAN

32. CHITRASHALA, CHHATAR-MAHAL, BUNDI, DISTRICT BUNDI.—The paintings on the walls and ceilings of the palace were found to be covered with dust, water marks, oil and soot, and in some areas, the pigments had even been washed away. The paintings were subjected to elaborate chemical cleaning with the help of solvents like ethyl and methyl alcohols, amyl acetate, acetone, petroleum ether, etc. The water and humus marks on the paintings were toned down. The broken edges of painted plaster were strengthened by filleting the borders. The paintings, after cleaning, were preserved with a coat of 2 per cent polyvinyl acetate in toluene. The work is in progress.

TAMIL NADU

33. KAILASANATHA TEMPLE, KANCHIPURAM, DISTRICT CHINGLEPUT.—The paintings, (pl. XCIII B), hidden under the thick lime plaster on the walls of some of the cells and sub-shrines in the compound of the temple, were exposed and were consolidated, cleaned and preserved. Cleaning and preservation of sculptures of eight subsidiary shrines and four sculptures of bulls on the northern side walls of this temple were also carried out. The dried moss and lichen patches were removed with the help of 1 per cent ammoniacal water. After cleaning, fungicide was applied on the surfaces and then preserved.

34. BRIHADISVARA TEMPLE, THANJAVUR, DISTRICT THANJAVUR.—Chemical treatment and preservation of Chola and Nayaka paintings in the Tandava gallery was continued. In Chambers 1 to 3 on the ground floor, paintings were cleaned with solvents for removal of dust, dirt and layers of smoke and finally preserved with a synthetic preservative. Loose and bulging plaster in Chambers 2, 5, 7 and 11 was consolidated with adhesives and consolidants.

The Maratha period paintings in Subrahmanyam shrine were found to be covered with accretions of dust and dirt and the pigment films showed a tendency of cusping and curling and

then detaching from the carrier layer. The paint film was fixed back to the surface with adhesives, and after cleaning, was preserved.

TRIPURA

35. LOOSE SCULPTURES, UNAKOTI HILLS, DISTRICT KAILASH SHAHAR.—Twenty loose sculptures, found in an advanced stage of decay due to constant exposure to the heavy rainfall, were moved to a temporary shed to save them from the solvent action of water. The sculptures were found to be covered with thick deposit of fungi and algal growths. They were cleaned with the help of 2-5 per cent ammoniacal solution. After complete removal of moss and lichen, the sculptures were coated with 1 per cent zinc silicoflouride to ward off fungal growth in future. The sculptures, after complete drying, were preserved with a coat of 2 per cent polyvinyl acetate solution in toluene.

UTTAR PRADESH

36. ARAMBAGH BARADARI, AGRA.—The work of exposing the paintings on the walls and ceiling, hidden under the lime plaster in the Baradari, was continued, by softening the upper layers of lime plaster with dilute acetic acid and flaking it away with blunt wooden chisels. The thin fine lime layer, left on the surface of the paintings, was removed with the help of acetic acid in conjunction with organic solvents like acetone, alcohol and amyl acetate. As a result of the above mentioned treatment beautiful paintings in very bright colours, depicting flowery patterns, geometrical designs, birds and a fairy, have been exposed.

37. CHINI-KA-RAUZA, AGRA.—The enamel tiles on the western and southern walls, showing beautiful floral and geometrical patterns in multi-colours, were found to be covered with black dried moss and patches of lichen. The tiles were cleaned, in continuation of the cleaning of the dome with the help of ammoniacal water and soft nylon brushes. After cleaning, the area was given a fungicidal coat, followed by a coat of polyvinyl acetate as a fixative for the painted enamel.

38. TAJ-MAHAL, AGRA.—The marble slabs over the entrance to the mausoleum was found to be covered with dust, dirt, cobwebs, smoke and beehive deposits; the hydrolysis and oxidation of hooks and nails in the masonry had caused red and brown stains. The surface of marble was cleaned with the help of detergents like teepol B-300. The smoke and beehive wax deposits were removed with the help of alcohol, benzene, formalin and other solvents. The stains of iron oxide were reduced with the help of dioxan and other solvents. The cleaned surface of the arch and the walls were polished with a wax formulation and burnished with satin pads to give the marble its old lustre.

39. SHAIKH SALIM CHISHTI'S TOMB, FATEHPUR SIKRI, DISTRICT AGRA.—Salt efflorescence was occurring in the sandstone, as a result of which its layers were flaking off taking alongwith it the paintings seen on the walls and dome, depicting floral designs on a white plastered surface. After fixing the paintings to the stone, the soluble salts are being extracted. The work is in progress.

40. ZANANA PALACE, FORT, ALLAHABAD, DISTRICT ALLAHABAD.—The paintings in earth colours executed on a very thin plaster on the sandstone walls of the ground and first floors, were found covered with dust, dirt, cobwebs and accretions of smoke. The paintings

were subjected to chemical cleaning with organic solvents like alcohols, easters, ethers, etc. After cleaning, they were consolidated with a coat of polyvinyl acetate in toluene.

WEST BENGAL

41. SIVA TEMPLE, SUPUR, DISTRICT BIRBHUM.—The organic growths on the decorated terracotta plaques were removed by the application of dilute solution of liquor ammonia and tri-ethyl amine. The stains of calcereous nature were removed with the help of very dilute solution of acetic acid and hydrochloric acid. After thorough washing by stirrup pump for many days, the terracotta plaques were allowed to dry completely, and thereafter washed again with distilled water. Finally a coat of preservative solution of vinyl acetate of suitable strength was applied.

42. SIVA TEMPLES, SRIBATI, DISTRICT BURDWAN.—The organic growth on the decorated terracotta plaques of the three Siva temples were removed with the help of dilute solution of liquor ammonia and tri-ethyl amine. The stains of calcerous nature were removed with the help of very dilute solution of acetic acid and hydrochloric acid. After thorough washing by stirrup pump for many days, the terracotta plaques were allowed to dry completely, and were washed again with distilled water. Finally, a coat of preservative solution of vinyl acetate of suitable strength was applied.

43. RADHAGOVINDA AND RADHARAMAN TEMPLES, GOVINDANAGAR, DISTRICT MIDNAPORE.—The organic growths on the decorated terracotta plaques of the temples were removed with the help of dilute solution of liquor ammonia and tri-ethyl amine. The stains were removed with the help of very dilute solution of acetic acid and hydrochloric acid. After thorough wash ing by stirrup pump for many days, the terracotta plaques were allowed to dry completely, and thereafter washed again with distilled water. Finally, a coat of preservative solution of vinyl acetate of suitable strength was applied.

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM EXHIBITS[1]

Fifteen old regimental colours, some of them stitched on net cloth, received from the Indian Military Academy, Dehra Dun, in torn and brittle condition were chemically treated. De-acidification was achieved with the help of ammonia vapour. Thereafter, these were cleaned with diethylene chloride and tri-ethylene chloride, etc.

Fifty iron and thirty copper objects, received from the Excavations Branch of the Survey, Nagpur, were cleaned and preserved. A number of other objects from Kalibangan, twenty-three potsherds with Kharosthi inscription and three seals from Lothal were also cleaned and preserved.

Two pencil sketches, received from the Archaeological Museum, Srirangapatna, by the Regional Laboratory of the Survey at Hyderabad, were chemically cleaned and strengthened. These sketches showed some marks due to the fungal growth. The paper was also very brittle due to high acidity and was de-acidified and preserved.

A paper painting, received from the Archaeological Museum, Hampi, was having an old thick paper support. This support was replaced by a silk mount. After remounting, the painting was cleaned with organic solvents, and the pigment layer was consolidated.

[1]Information from the Chief Archaeological Chemist of the Survey.

Museum objects from the Archaeological Museum, Fort St. George, Madras, such as palanquin, bronze petard, porcelain bowl, etc., were chemically treated for removing the darkened varnish from the surface. After cleaning, they were preserved with a coat of preservative.

Sculptures in the Tipu Sultan Palace, Bangalore, and from nearby sites in Karnataka were chemically treated to remove the undesirable disfiguring accretions.

ANALYSES AND RESEARCH[1]

GEOCHRONOLOGICAL STUDIES.—Bones and specimens from excavated sites like Kalibangan and Piprahwa were put to fluorine analysis.

Chemical examination of ancient building material like stones and bricks was undertaken for understanding the causes and extent of deterioration.

CHEMICAL ANALYSES.—Experiments were carried out to assess the efficacy of silicone water repellants in retarding the growth of moss and lichen on marble and other stone surfaces which remain subject to damp conditions after removal of this type of vegetational growth. Comparative performance of the silicone products made in India and abroad is being observed. Experiments are being conducted also with reference to atmospheres with different pollutant environments. The effect of effluents from wood fuel in the vicinity of Channakesava temple in District Hassan is also being studied.

During the chemical treatment of the paintings in Ajanta, some stubborn accretion were found to be unresponsive to the solvent or disrupting action of organic solvents. In the course of investigation of the nature of the accretion, some indication of the presence of case-in was available. Treatment with dilute formic acid solution was found effective in the removal of such accretion and the uncovering of pigments of bright tones underneath. Some other accretion in Cave 10 on the j pillars is, however, still under investigation and appears to be mineral in character.

Experiments on the use of epoxy resin for consolidation of crumbling stones at Kanchi-puram, Mahabalipuram and Elephanta caves led to the observation that this resin was quite useful in consolidating the friable stone. But it was noticed that an unwanted yellow lustre of the cured resin produced a jarring look. Experiments for minimising such undesirable effects are in progress.

In Brihadisvara temple at Thanjavur, the tempera paintings on the ground floor chamber are in two layers, the earlier Chola paintings being superimposed by the later Nayaka. As such, a hot water soluble gelatine facing used for detaching fresco paintings was found unsuitable for this purpose. A synthetic resin facing was accordingly tried and was found suitable. Some of the Nayaka paintings in one of the chambers have thus been successfully stripped and are to be transferred to a suitable support.

A harmonal formulation for controlling the growth of moss and lichen on monuments is being evaluated.

The chemical analyses of the accretions found on the paintings on the ceiling of the main cell in Cave 3 at Bagh in District Dhar has indicated that they consist of shellac varnish mixed with dust particles.

In the laboratories at Ajanta, Bagh and Dehra Dun, several cross-sections of paints and paintings were made with a view to studying the nature of pigments, plaster and accretions. These sections were of substantive use in understanding both the causes of deterioration and the

[1]Information from the Chief Archaeological Chemist of the Survey.

formation of the accretion. The information so collected has helped in developing suitable methods of cleaning and preserving the paintings.

A number of ancient potsherds of different types and fabrics from several sites were taken up for determining the porosity. Thin sections of these sherds are also being prepared for ascertaining the technique of fabrication and their materials.

Under a research project[1], samples of habitational deposits, belonging to various cultures were collected from Daimabad, District Ahmadnagar. In addition, the samples of black cotton soil, underlying the Savalda cultural deposit, as well as from the present surface of the adjoining fields were also collected for comparision. All these samples were analysed for relative content of phosphorus, nitrogen, humus and calcium. The usual soil characteristics like the PH, salinity, carbonate contents were also determined. Although no positive conclusion can be drawn from the experiments so far carried out, it may be tentatively hinted that there seems to be maximum human activity during the earlier two cultural periods viz., Savalda and late Harappan.

Analyses of different cultural levels at the sites of Bhagwanpura, Betamcharla caves, Apegaon and Somnath are in progress.

[1]Information from Professor R. V. Joshi and Dr G. G. Majumdar, who were assisted by Shri B. C. Deotare of the Deccan College Post-graduate and Research Institute, Pune.

XI. ARCHAEOLOGICAL GARDENS[1]

ANDHRA PRADESH

1. ARCHAEOLOGICAL MUSEUM, AMARAVATI, DISTRICT GUNTUR.—The low-lying area had been levelled with sweet soil, and the surroundings of the Museum were considerably improved after proper cleaning.

2. HILL-TOP, NAGARJUNAKONDA, DISTRICT GUNTUR.—One thousand saplings of various kinds were planted and new lawns laid out in front of the guest house.

3. GOLCONDA FORT, DISTRICT HYDERABAD.—For landscaping the precincts of the Fort, consequent on a decision taken at a meeting of the authorities of the State Government, it was decided to restore, as the first step, the original layout of the Naginabagh, which had fallen into ruins. As a result of much careful work, the original garden has started taking shape, and the work would continue in the next year also.

BIHAR

4. EXCAVATED REMAINS AND ARCHAEOLOGICAL MUSEUM, NALANDA, DISTRICT NALANDA.—Besides maintaining the existing garden, steps are being taken to improve the irrigation system by introducing new pipes.

5. EXCAVATED REMAINS, KUMRAHAR, DISTRICT PATNA.—About a hectare of land was returfed in order to give a face-lift to the area.

DELHI

6. RED FORT, DELHI.—The garden was kept in a nice condition throughout the year and fountains in the Rang-mahal are played during the 'sound and light' show. Rare varieties of roses were planted in the museum area.

7. HAUZ-KHAS, NEW DELHI.—Besides maintaining the garden properly, the lawns were returfed.

8. HUMAYUN'S TOMB, NEW DELHI.—The area of Arab-ki-Sarai was beautified by returfing and judicious planting. As per the suggestions of the Delhi Landscape Committee several seasonal beds were added to the garden. Furthermore, installation of motor of 22 horse power in the Bungali Pir area has eased the water problem and this factor may eventually help in reviving the ancient channels and fountains.

9. HUMAYUN'S TOMB NURSERY, NEW DELHI.—Several new varieties of roses brought from Agra, Jaipur and other places have been planted systematically for propagational purposes. Exhibits raised in this nursery won several prizes in the Delhi Flower Show.

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[1]Information from the Chief Horticulturist of the Gardens Branch of the Survey which regularly maintains about ninty archaeological gardens; only those gardens where notable works were executed or are being taken up have been included in this Chapter. Some State Governments also maintained gardens around archaeological sites and monuments.

10. KHAIRUL-MANZIL (SHER SHAH'S GATE), NEW DELHI.—The gardens towards the High Court side was developed by planting flowering trees. A few more annual beds were carved out in the Sher Shah's gate area.

11. KHAN-I-KHANA, NEW DELHI.—The lawns were regrassed around the monument. A new set of pipelines have been laid for solving the problem of water supply.

12. NAJAF KHAN'S TOMB, NEW DELHI.—New roses have been planted in one sector of the garden and for improving water supply a motor pump-set has been installed.

13. PURANA QILA, NEW DELHI.—The entire area of the fort has now been developed and profuse flowering of annual and perennial plants is indeed a sight to enjoy. Suggestions put forth by the Delhi Landscape Committee have been followed here in the new Scheme of planting and about one thousand saplings have been planted. The installation of a 22 horse power electric motor in the old *baoli* has improved the water supply to a great extent.

14. SAFDARJUNG'S TOMB, NEW DELHI.—Heavy casualties of both annual and perennial plants as a result of flooding during rains caused damage to the garden. However the garden has been brought back to the normal state after several remedial measures.

GOA

15. ARCHAEOLOGICAL AREA, VELHA GOA.—After last season's *(1974-75,* pp. 128-129) returfing, the work of planting extensively selected varieties of shrubs and herbacious perennials has been taken up.

JAMMU AND KASHMIR

16. MARTAND TEMPLE, DISTRICT ANANTNAG.—Grassing work is in progress while approach pathways have been made ready. For extending the garden, more area is being acquired.

KARNATAKA

17. ARCHAEOLOGICAL MUSEUM, HAMPI, DISTRICT BELLARY.—A beautiful garden covering an area of one hectare has been laid out around the Museum and it is characterized by vast lawns, extensive shrubbery dotted with peripheral row of flowering trees and a few seasonal flower beds.

18. ALI II ROUZA, BIJAPUR, DISTRICT BIJAPUR.—A slope provided last year by changing the land-surface has been grassed while green lawn and flowering plants continue to be main tained in perfect condition. At the rear side of the monument have been planted groups of flowering trees.

19. ASAR-MAHAL, BIJAPUR, DISTRICT BIJAPUR.—The pathways have been relaid.

20. GOL-GUMBAD, BIJAPUR, DISTRICT BIJAPUR.—The lawns of the upper platform around the monument have now been receiving water supply from *Khani* ('pond') where an additional pump-set of 10 horse power has been installed to augment the supply from the pumping point at Gagan-mahal. This arrangement has made it possible to maintain the rear part of the garden in a satisfactory manner. A large number of tree seedlings of different varieties have been planted in the rocky substratum towards the eastern side in order to raise a nice arboretum.

21. IBRAHIM ROUZA, BIJAPUR, DISTRICT BIJAPUR.—The archaeological land lying in front of the monument towards the western side has been fenced by the barbed wire fencing. Garden operations, including the levelling of the ground, are in progress despite the shortage of water supply. A car park has been provided at the entrance.

22. JOD-GUMBAD, BIJAPUR, DISTRIGT BIJAPUR.—The area amidst the ruined *dalans* has been developed, whereas in the other part of the garden was grown new plantation.

23. SIKANDAR SHAH'S TOMB, BIJAPUR, DISTRICT BIJAPUR.—Shrubs and trees planted last seasons *(1974-75,* p. 130) are coming up well, while the green lawns continue to remain in nice condition.

24. HOYSALESVARA TEMPLE, HALEBID, DISTRICT HASSAN.—As a result of the drying up of the *dvara-samudra,* the source of water-supply here, the irrigation system suffered very much. Yet taking advantage of this dried up lake, sufficient quantity of silt was collected for spreading it in the flower beds. About 480 m long of Kerb stones were pitched on either side of the path ways in the extended part of the garden.

25. DARIA DAULAT BAGH, SRIRANGAPATNA, DISTRICT MANDYA.—The young plants are growing to maturity. Further, propagational activities were intensified to meet the demands of the gardens of the Southern Zone, besides other exigencies. As the vast mango orchared required careful soil conservation, action was taken to transform the slopy surface into terrace in order to improve the orchard.

26. GUMBAZ, SRIRANGAPATNA, DISTRICT MANDYA.—The strip of land on the right side of the main entrances was converted into a lawn. Two Canna beds were planted on both sides of the entrance gate. Few groups of flowering trees were planted in the two front lawns on either side of the main gate. The orchard was further improved by planting casualties and fillers such as lime, papaya, etc.

27. KESAVA TEMPLE, SOMANATHPUR, DISTRICT MYSORE.—The rear side along the barbed-wire fencing has been lined with bougainvilleas.

MADHYA PRADESH

28. ARCHAEOLOGICAL AREA, KHAJURAHO, DISTRICT CHHATARPUR.—In order to solve permanently the problem of water scarcity a well is being sunk in the river bed and already a wide network of pipelines has been set up to cover partially the eastern and western groups of the garden, which are being kept in nice condition throughout the year.

29. ARCHAEOLOGICAL AREA, BURHANPUR, DISTRICT KHANDWA.—In spite of shortage of water supply the plantation work was completed during the period under review.

MAHARASHTRA

30. BIBI-KA-MAQBARA, AURANGABAD, DISTRICT AURANGABAD.—In continuation of the previous season's work *(1974-75,* p. 131), the forecourt in front of the monument was beautified by means of laying new plots of lawns, planting several trees, shrubs, etc.

31. FORT, SHANWARWADA, PUNE, DISTRICT PUNE.—The work of reviving the old garden was taken up; consequently, several shrubberies have been rejuvinated and lawns returfed. These apart, necessary hedges and edges have been introduced at appropriate places.

ORISSA

32. BHASKARESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—It has been decided to enlarge the size of the well with a view to getting more water needed for extending the garden operation.

33. MUKTESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—A small garden around the temple has been developed. The land lying between this and the Parasuramesvara temple has also been taken over for development.

34. RAMESVARA TEMPLE, BHUBANESWAR, DISTRICT PURI.—The landscaping of the surroundings has been completed and steps are being taken to introduce some sacred plants.

35. SUN TEMPLE, KONARAK, DISTRICT PURI.—As no plantation is possible on mere sand it has been decided to replace 20 cm of sand deposit by sweet soil. A bore well which is likely to yield 55-550 litres of water per hour has been sunk and irrigational pipe lines already laid within the enclosure.

36. LORD JAGANNATHA TEMPLE, PURI, DISTRICT PURL—Sacred plants of different varieties have been planted in large number in the Nilachal-dham and the Vaikuntha-dham for providing flowers for daily *puja* in the temple.

RAJASTHAN

37. ANNA-SAGAR BARADARI, AJMER, DISTRICT AJMER.—Besides attending to all seasonal horticultural operations, new flower beds of Canna and rose were introduced.

38. DIG-PALACE, DIG, DISTRICT BHARATPUR.—The area outside the garden known popularly as Kachha-bagh had been taken over from the Government of Rajasthan and deve lopmental activities have already been initiated. Introduction of additional varieties of rose, jasminium and other plants has made the existing garden attractive. Here the irrigation system has also been improved.

UTTAR PRADESH

39. AGRA FORT, AGRA, DISTRICT AGRA.—Of the two main gardens here, the inner one was maintained satisfactorily, while efforts are being made to improve the irrigational facilities of the outer garden. The area, duly fenced after clearance-work, from Amar Singh gate to the Agra Fort station has been handed over to the State Government.

40. IDGAH, AGRA, DISTRICT AGRA.—The old pipeline damaged by corrosive action has now been replaced by P.V.C. pipes.

41. KHAN-E-ALAM NURSERY, AGRA, DISTRICT AGRA.—Being the central nursery of the Gardens Branch propagational activities were intensified by introducing several new varieties of plants.

42. MARIUM'S TOMB, AGRA, DISTRICT AGRA.—Three picnic spots have been developed here. Moreover, the outlived lawns were returfed and the old pipelines replaced by P.V.G. pipes of wider diameter to ensure proper water supply.

43. RAM-BAGH, AGRA, DISTRICT AGRA.—The rosarium has been extended and the orchard considerably improved by digging, cleaning and planting good varieties of fruit plants. A good picnic spot has been developed in the precinct and arrangements made to provide drinking water, so long not available, by giving a tap-connection with the municipal water-supply.

44. TAJ-MAHAL, AGRA, DISTRICT AGRA.—The garden was maintained in extremely good condition throughout the year and the fountains are being played regularly in the morning and evening. Lowering the shrubberies and replanting of scented indigeneous have been taken up.

45. FATEHPUR-SIKRI, DISTRICT AGRA.—Efforts are being made to provide adequate water for this expansive garden, which was maintained in spite of many difficulties in satisfactory manner. The hydrogeologist of the Underground Water Supply Division is to inspect the site for exploring the possibility of getting more ground water.

46. AKBAR'S TOMB, SIKANDRA, DISTRICT AGRA.—The rosarium has been extended by planting two thousand budded rose of good varieties. Irrigational facilities have been increased by boring a tube-well here.

47. ARCHAEOLOGICAL AREA, KUSHINAGAR, DISTRICT DEORIA.—The work relating to the relaying of pipe line and construction of cabin room at the newly-bored tube-well is in progress.

48. ARCHAEOLOGICAL AREA, SAHET MAHET (ANCIENT SRAVASTI), DISTRICT GONDA.—The work of fencing the vast area at Mahet by barbed wire is in progress. A big tube-well, to be bored by the Central Public Works Department shortly, is likely to provide good irrigational facilities to the proposed garden. Besides the formation of patios around the ruined structures, the leading pathways have been formed with lime-concrete. Improvements of the pond along with the drain leading to it have to be carried out soon.

49. NADAN-MAHAL, LUCKNOW, DISTRICT LUCKNOW.—To overcome the problem of acute water shortage a well near the old tube-well has been sunk, and it has started supplying water.

50. RESIDENCY, LUCKNOW, DISTRICT LUCKNOW.—The rosarium of this garden has been fenced with provision for suitable gates as a measure of safety.

XII. PUBLICATIONS

PUBLICATIONS OF THE SURVEY

1. CORPUS INSGRIPTIONUM INDICARUM.—Volume VI of the *Corpus Inscriptionum Indicarum,* 'Inscriptions of the Silaharas'by V. V. Mirashi was published.

2. EPIGRAPHIA INDIGA—ARABIC AND PERSIAN SUPPLEMENT.—-The number for the year 1971 is in the final stages of printing

3. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—Number 77 of the Memoirs of the Survey, *The Indus Script—Texts, Concordance and Tables,* by Iravatham Mahadevan was published.

4. GUIDE BOOKS.—Guides to *Konarak* (second edition), *Pandrethan, Avantipur andMartand,* both by Debala Mitra, *Khajuraho* (fifth edition) by Krishna Deva and *Khajuraho Museum* (second edition) by Krishna Deva and B. S. Nayal, were printed.

5. PICTURE POSTCARDS.—Picture postcards sets of fifty different monuments of national importance were printed. Besides, picture postcards sets of Aihole, Badami, Delhi (A, B, C), Gwalior, Kanchipuram, Nalanda and Pattadakal were also reprinted.

OTHER PUBLICATIONS

HIMACHAL PRADESH.—The Department of Languages and Cultural Affairs, Government of Himachal Pradesh, published *Arts of Himachal,* edited by Dr V. C. Ohri, containing articles by eminent authors on monuments, sculptures, paintings, coins, etc.

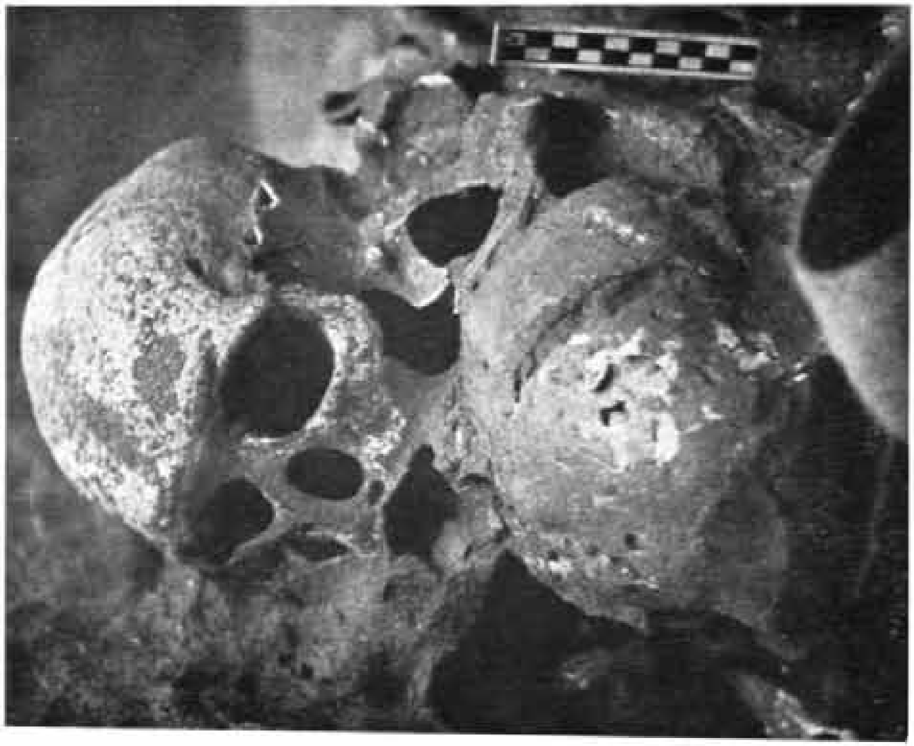


A



B

Dhulikatta : A, *exposed cells with verandah towards north-west of stupa*; B, *hall with brick-paved flooring, Phase III.* *See p. 4*



B



D

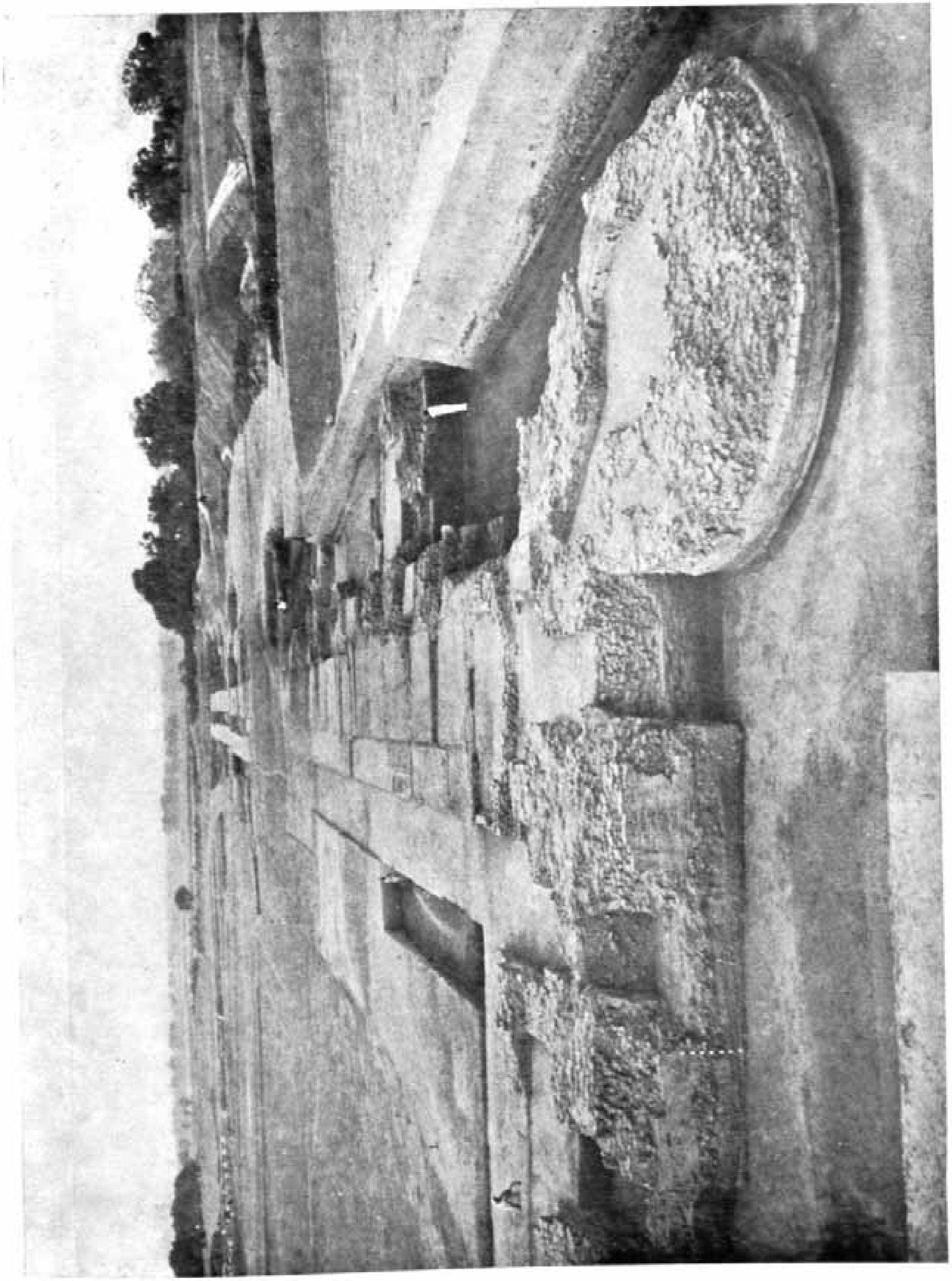


A

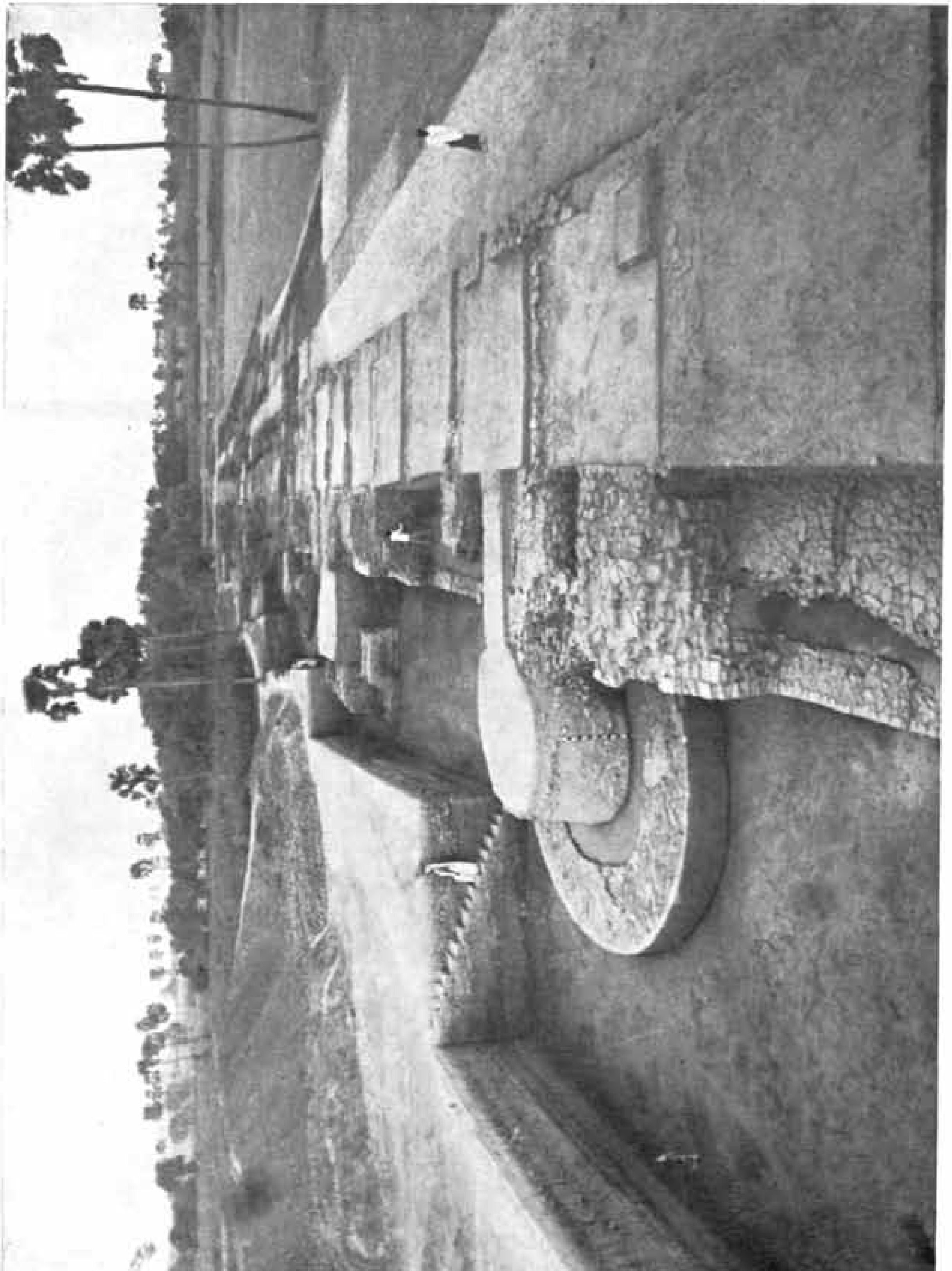


C

A, exposed Megalith 2; B, contents of Megalith 2; C, exposed sarcophagus, Megalith 4, all from Agripalli; D, [illegible] of megalithic period from Polakonda. See pp. 5 and 10



Antichak : view of eastern wing of monastery. *See p. 11*



Antichak : view of southern wing of monastery. *See p. 11*

A



B



C



D



Antichak : sculptures of A, *Kamadeva*; B, *Shadakshari Avalokitesvara* ; C, *Lokesvara*; D, *head of Lokesvara*. *See p. 11*

A


B

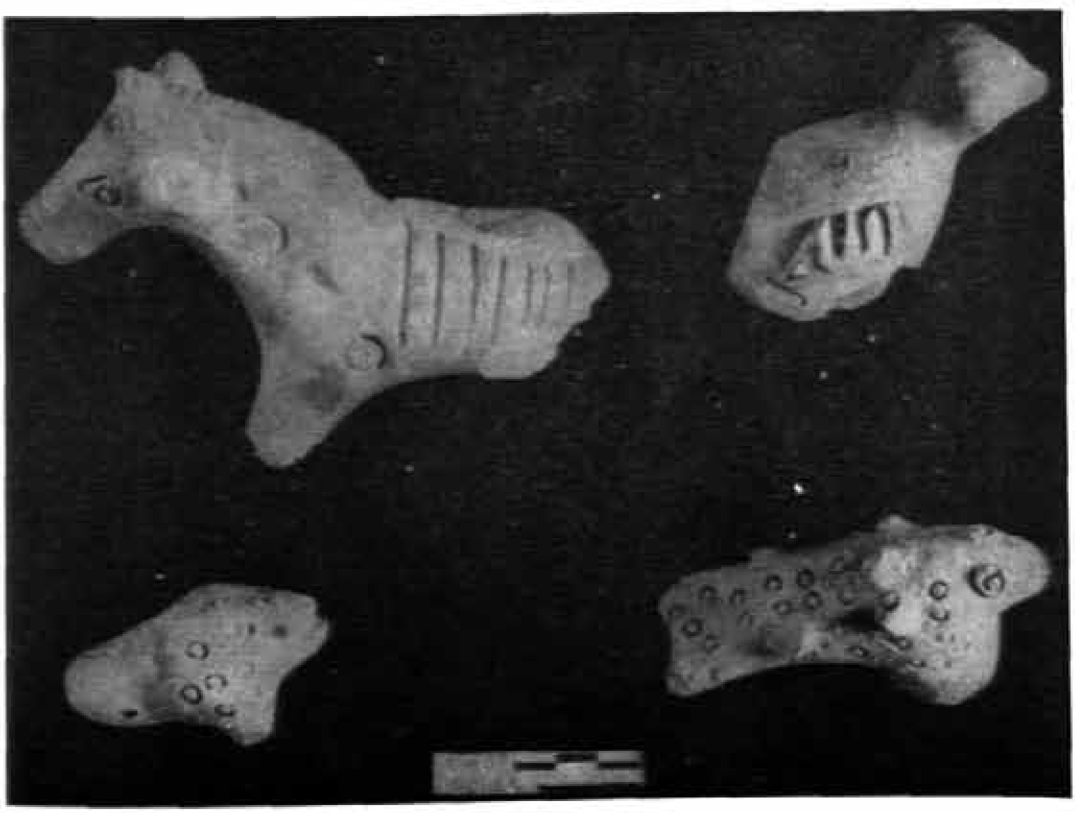

C


D


Antichak : A, *terracotta objects*; B, *unidentified image*; C, *dragon-face*; D, *Manjusri*. *See p. 11*

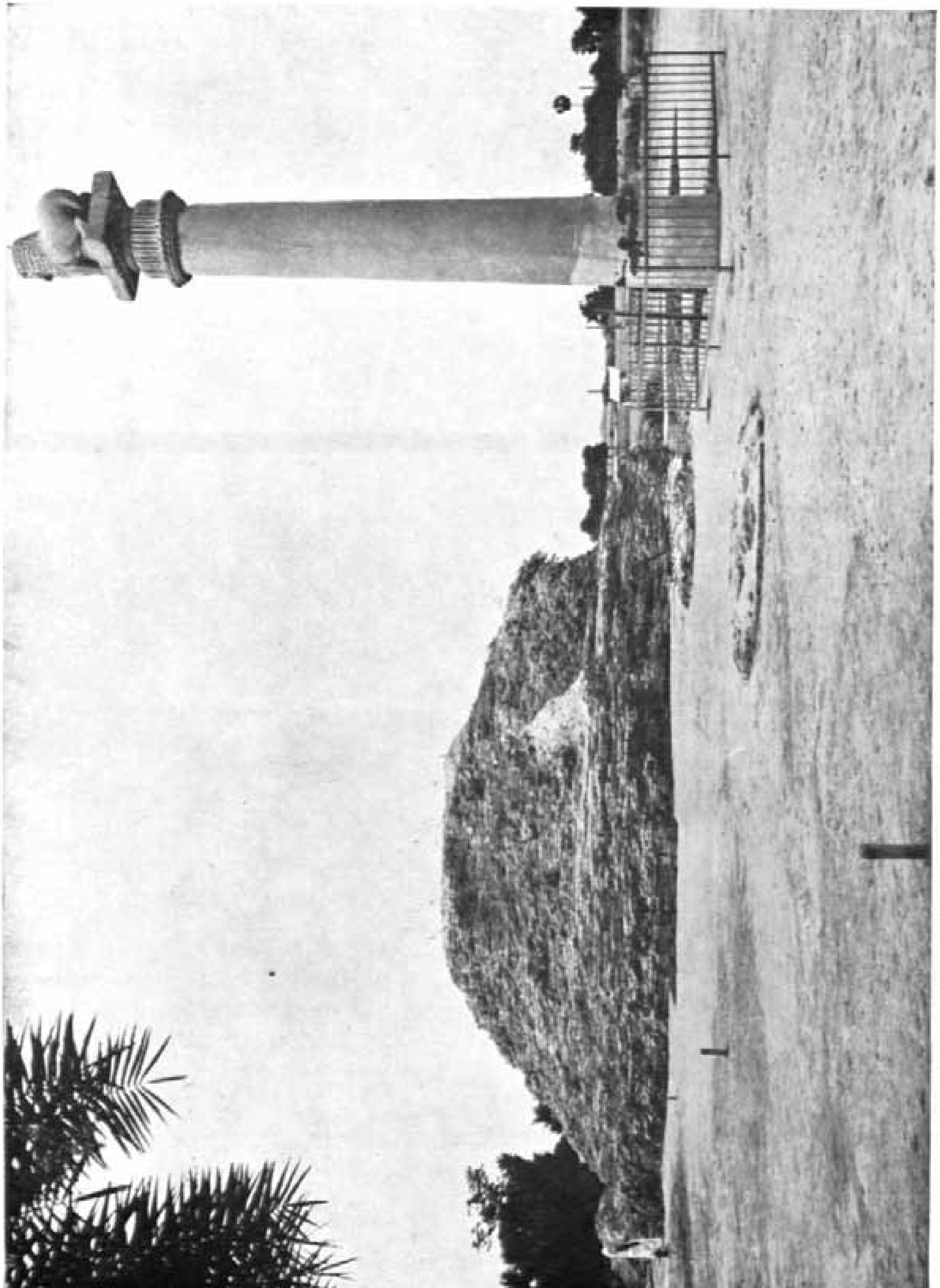


A



B

Katragarh : terracotta figurines. *See p. 12*



Kolhua : general view of stupa. *See p. 13*



A



B

Kolhua : A, *view showing three structural phases of stupa*; B, *miniature stupas around main stupa*. *See p. 13*



A



B

A, *view of raised beach at Dwaraka*; B, *Karvan : exposed basement of a shrine.* *See pp. 15 and 18*



A



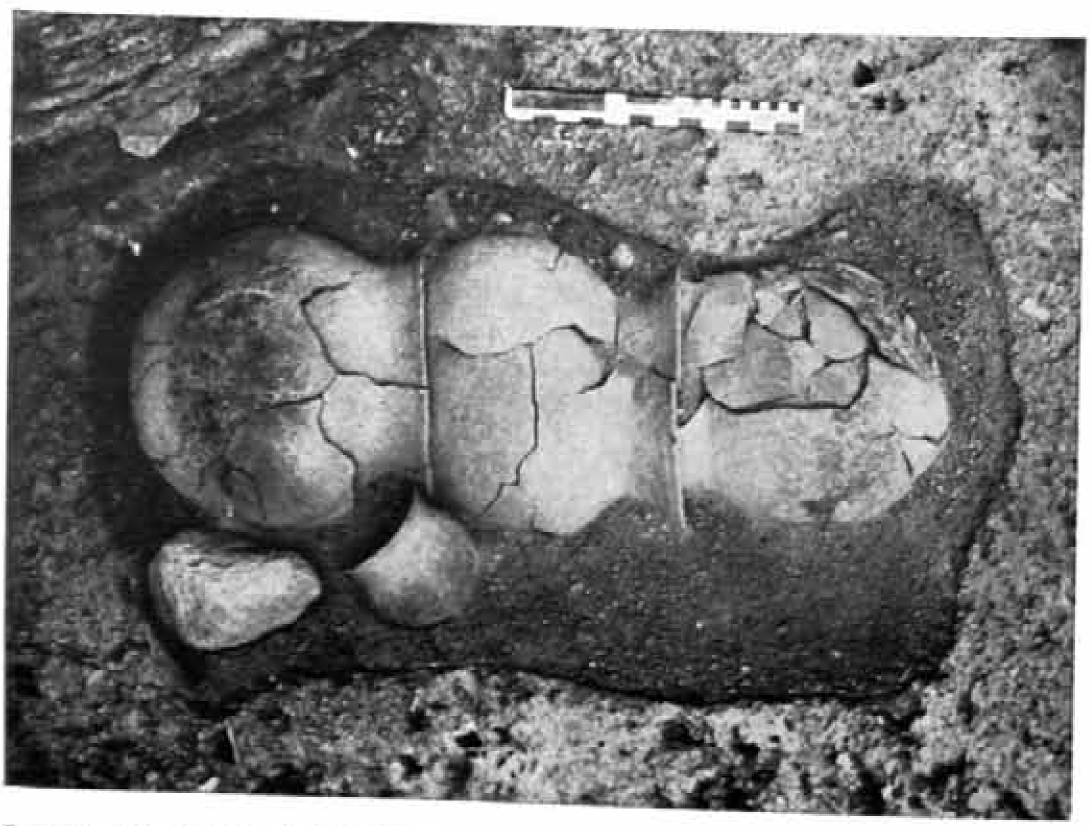
B

Karvan : views of exposed structures. *See p. 18*

A



B



A, *Daulatpur* : *pottery types, Period* I; B, *Hallur* : *triple-urn burial, chalcolithic phase.* *See pp.* 19 *and* 25

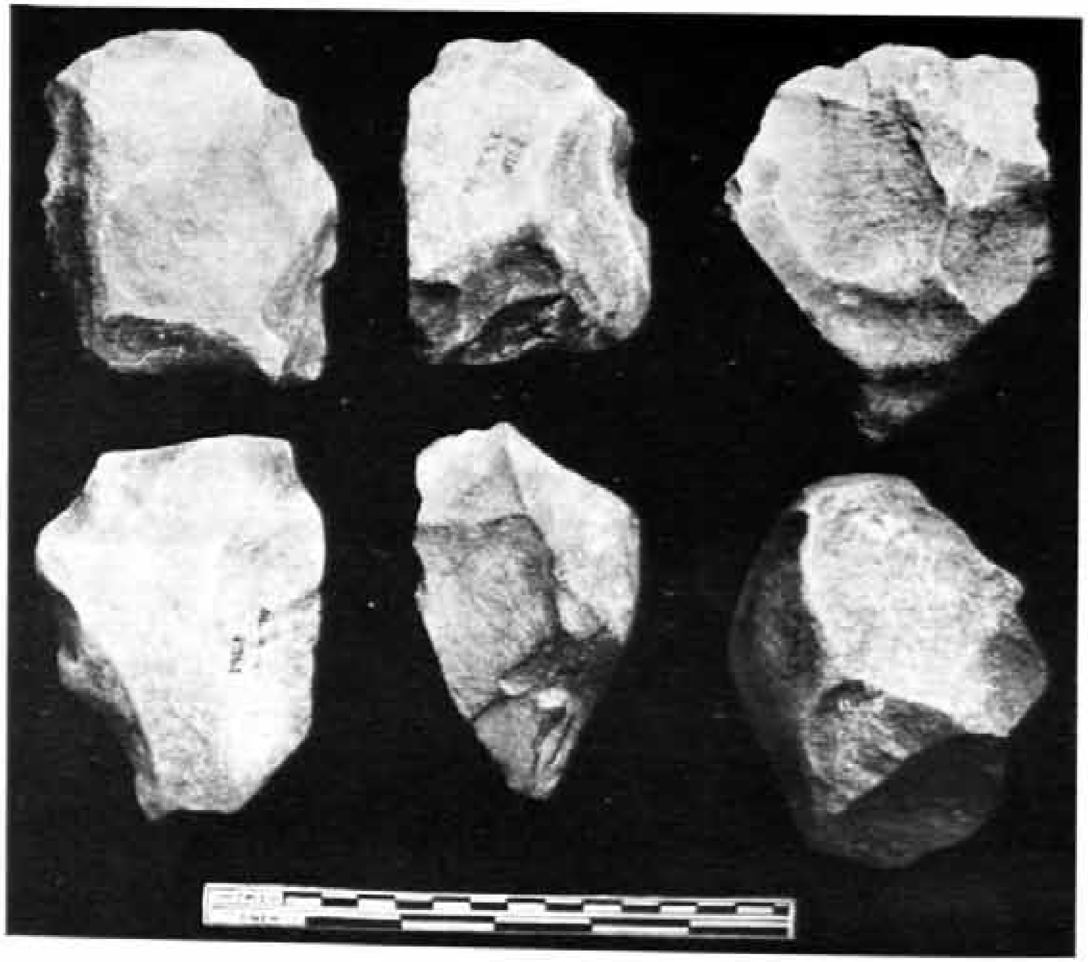




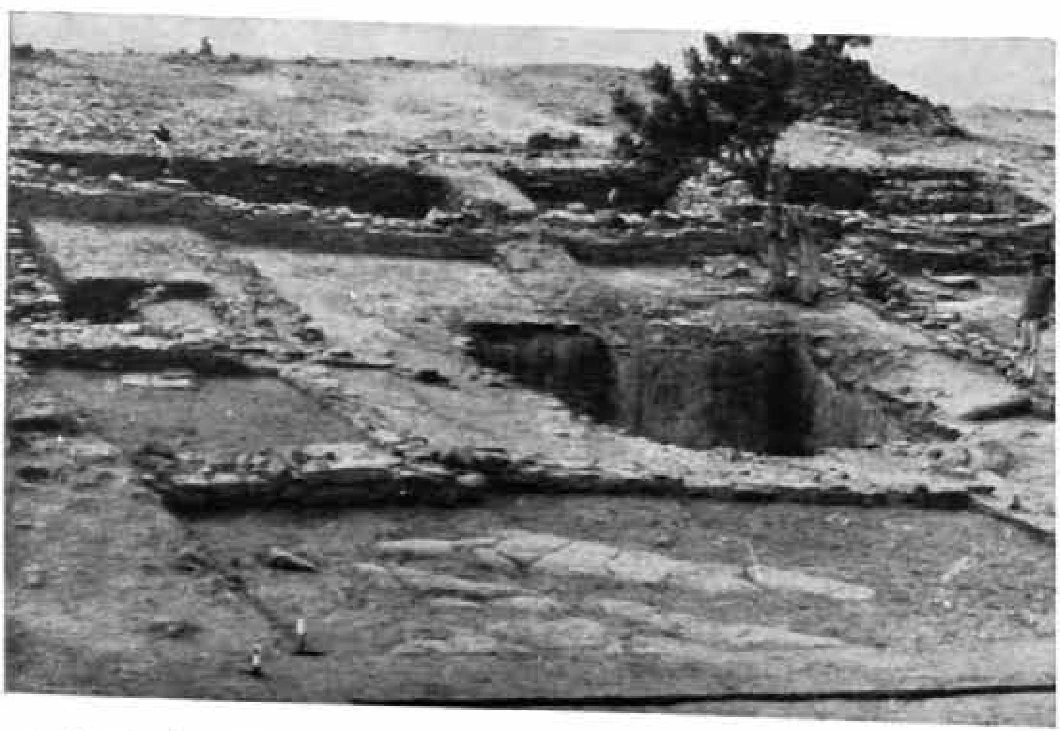
A B

Manda : A, *view showing cultural sequence and exposed structures*; B, *double spiral-headed pin of copper, Sub-period IA.* *See p. 21*

A



B



A, *Hampi* : *Lower Palaeolithic tools*; B, *Raisen fort* : *exposed structures*. *See pp.* 24 *and* 30



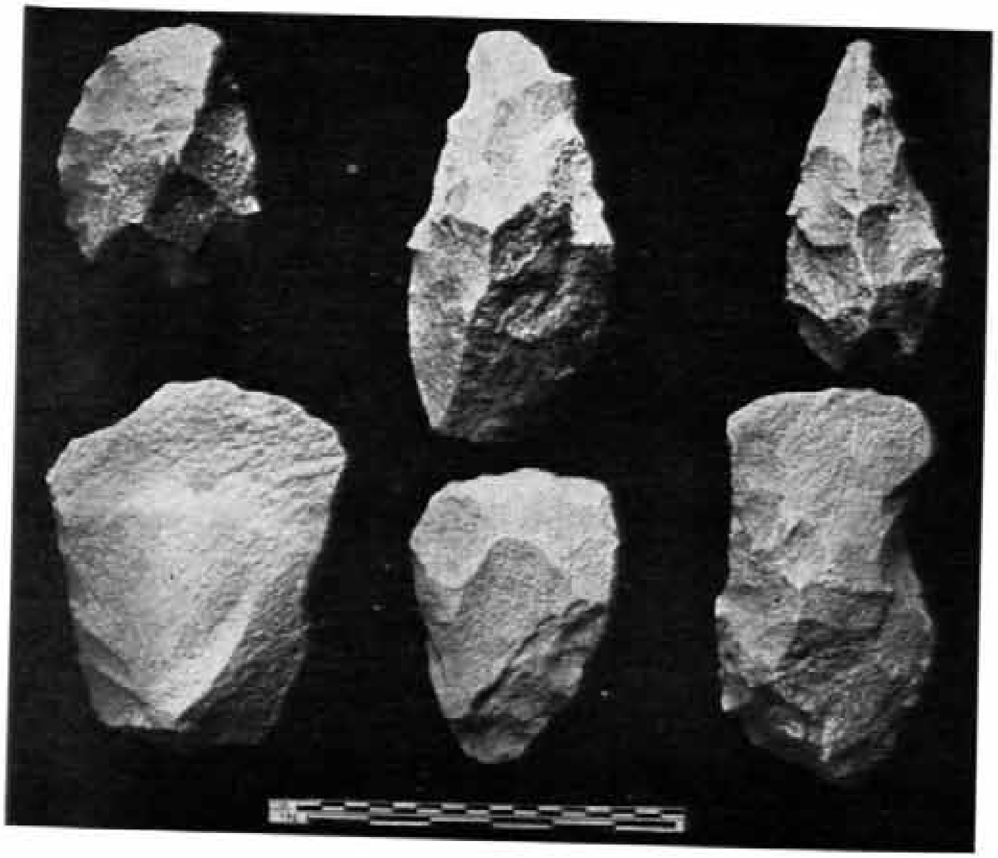
A



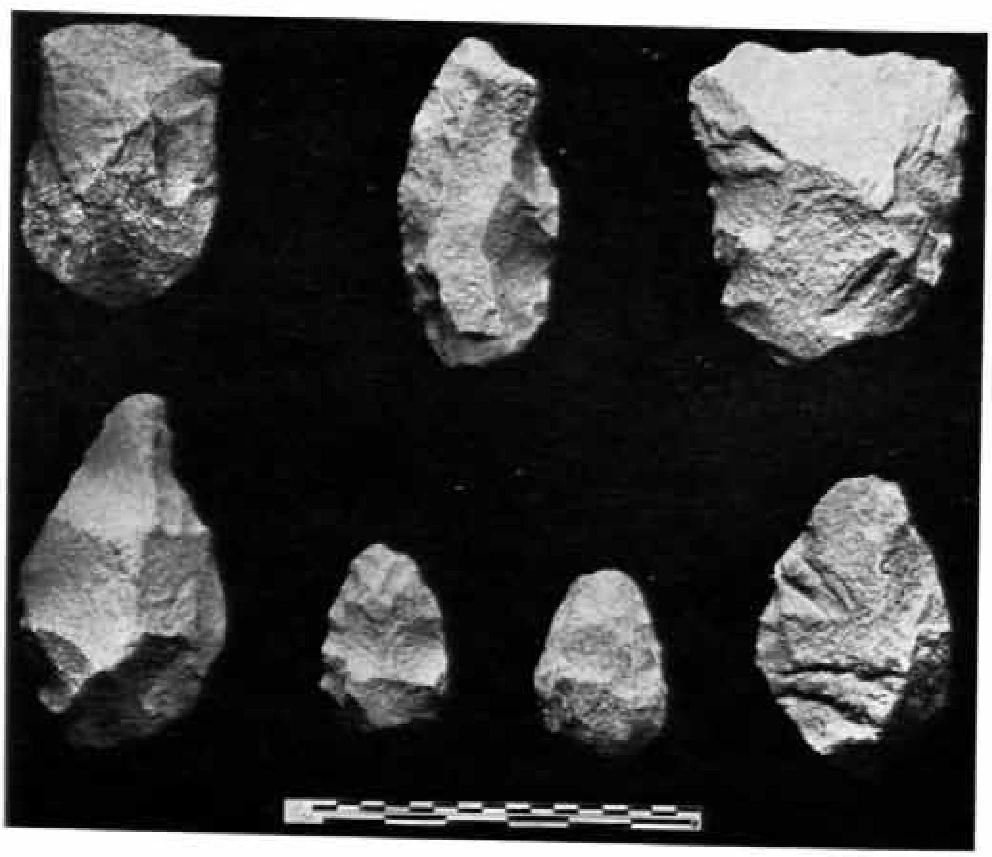
B

Raisen fort : views of exposed structures. *See p. 30*

A



B



Lower Palaeolithic tools : A, *from Hathidoh*; B, *from Patni*. *See p. 32*



A

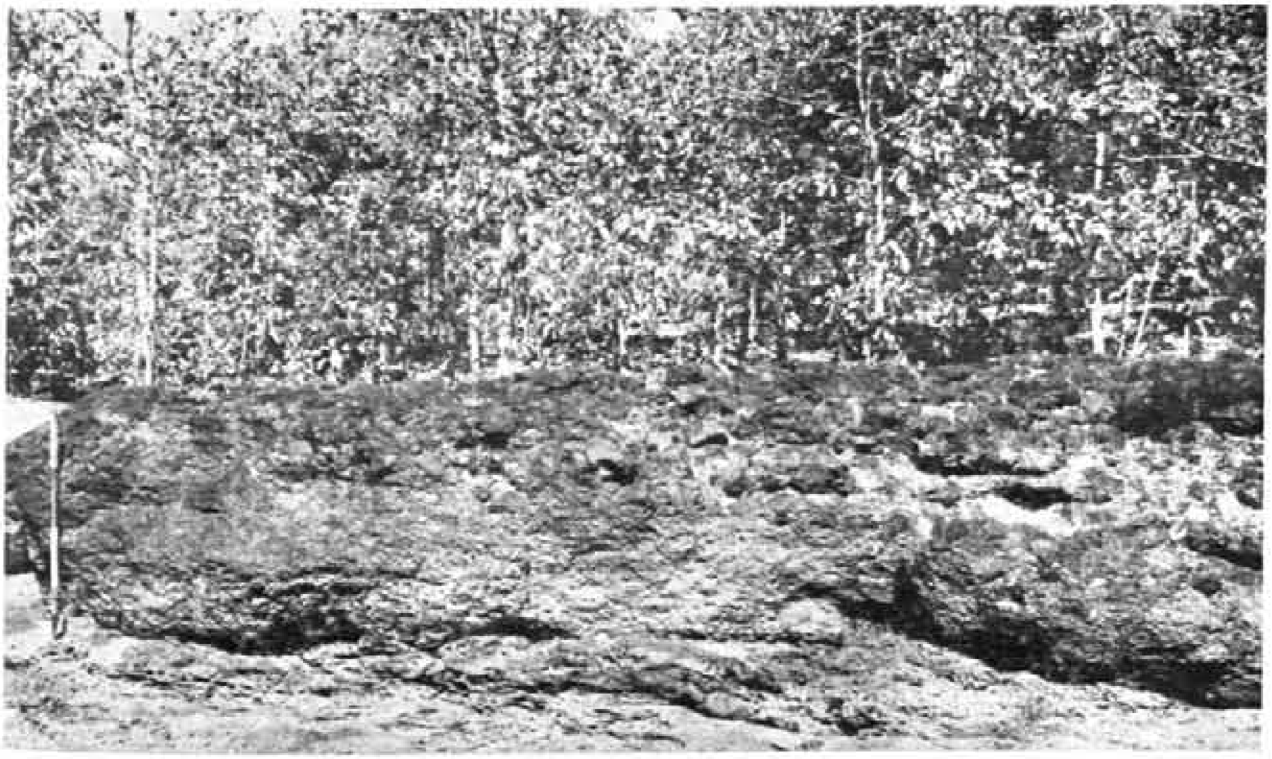


B

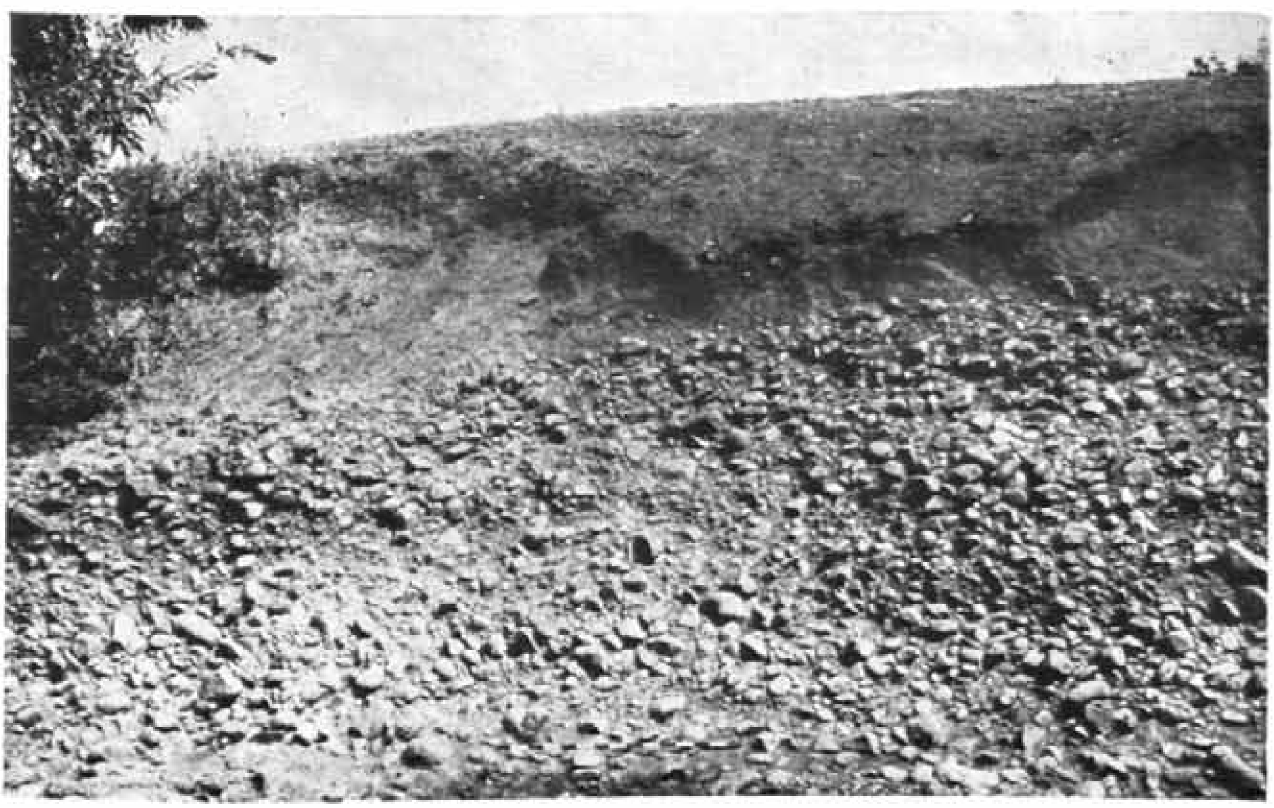
A, *Pathareghat* : *section of the right bank of the Bhagner nullah*; B, *Pirikarar* : *section of the left bank of the Kalladoh nullah*. *See p.* 32



Pirikarar : section of the right bank of the Kalladoh nullah. *See p. 32*



A



B

A, *Gerughat : section of the left bank of the Bhagner nullah*; B, *Andikachhar: section of the left bank of the Bhagner nullah.* *See p. 32*

A



B



A, *Khandahar* ; *view of laterite deposit below lateritic boulder conglomerate*; B, *Pirikaror*: *section of left bank of the Kalladoh nullah*. *See p. 32*



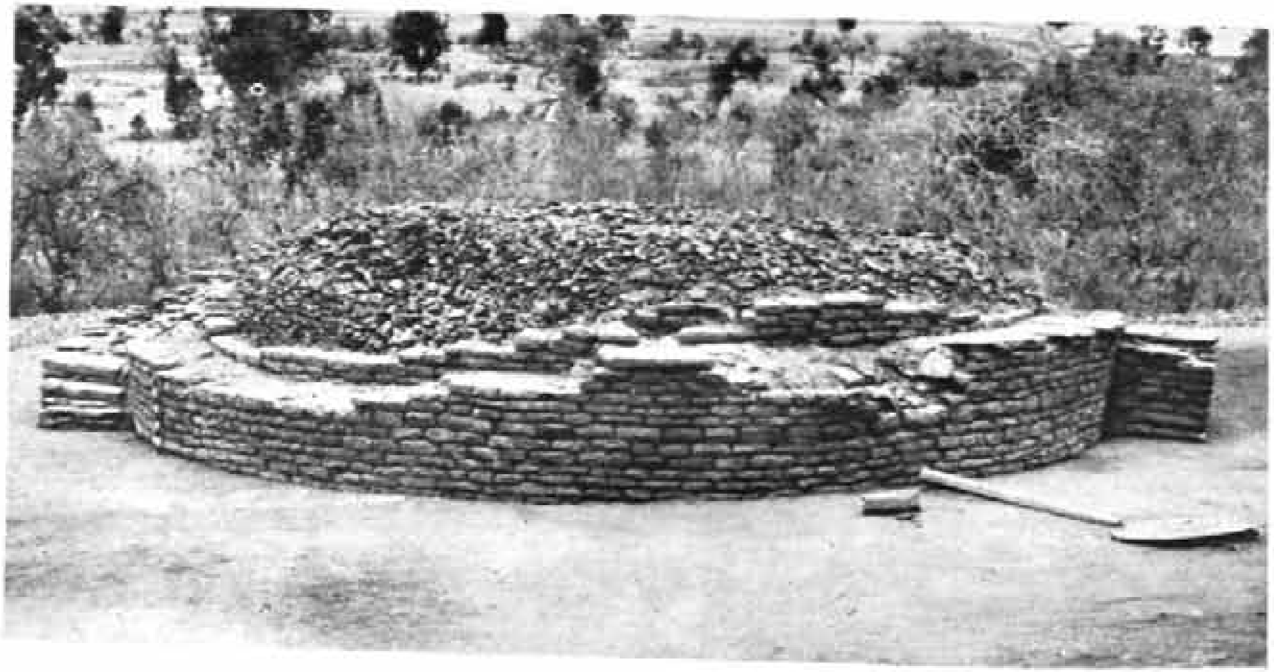
A



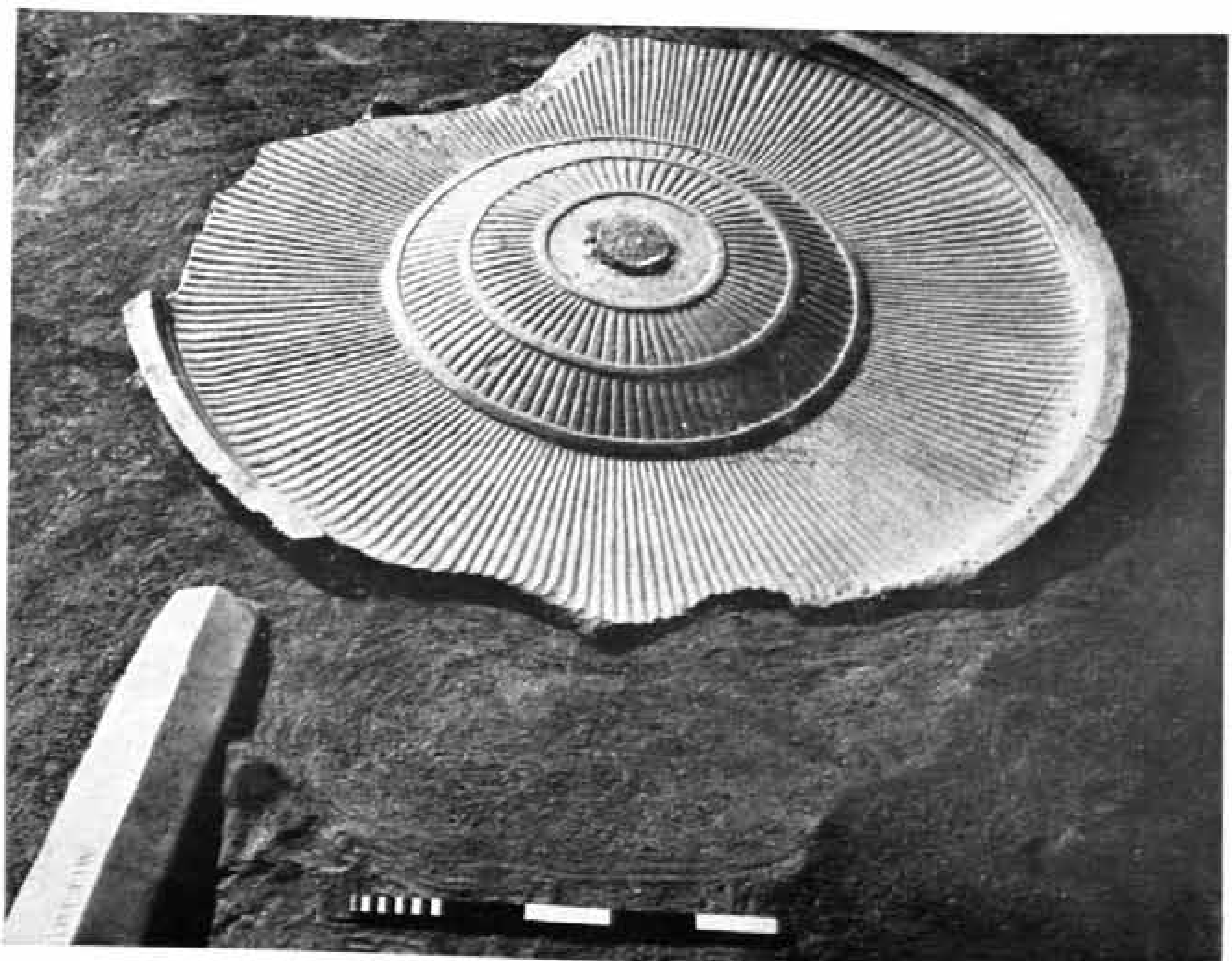
B

A, *Bandra Ban* : *section of right bank of the Narmada*; B, *Pangoraria* : *view of Buddhist site before excavation.* *See p. 32*

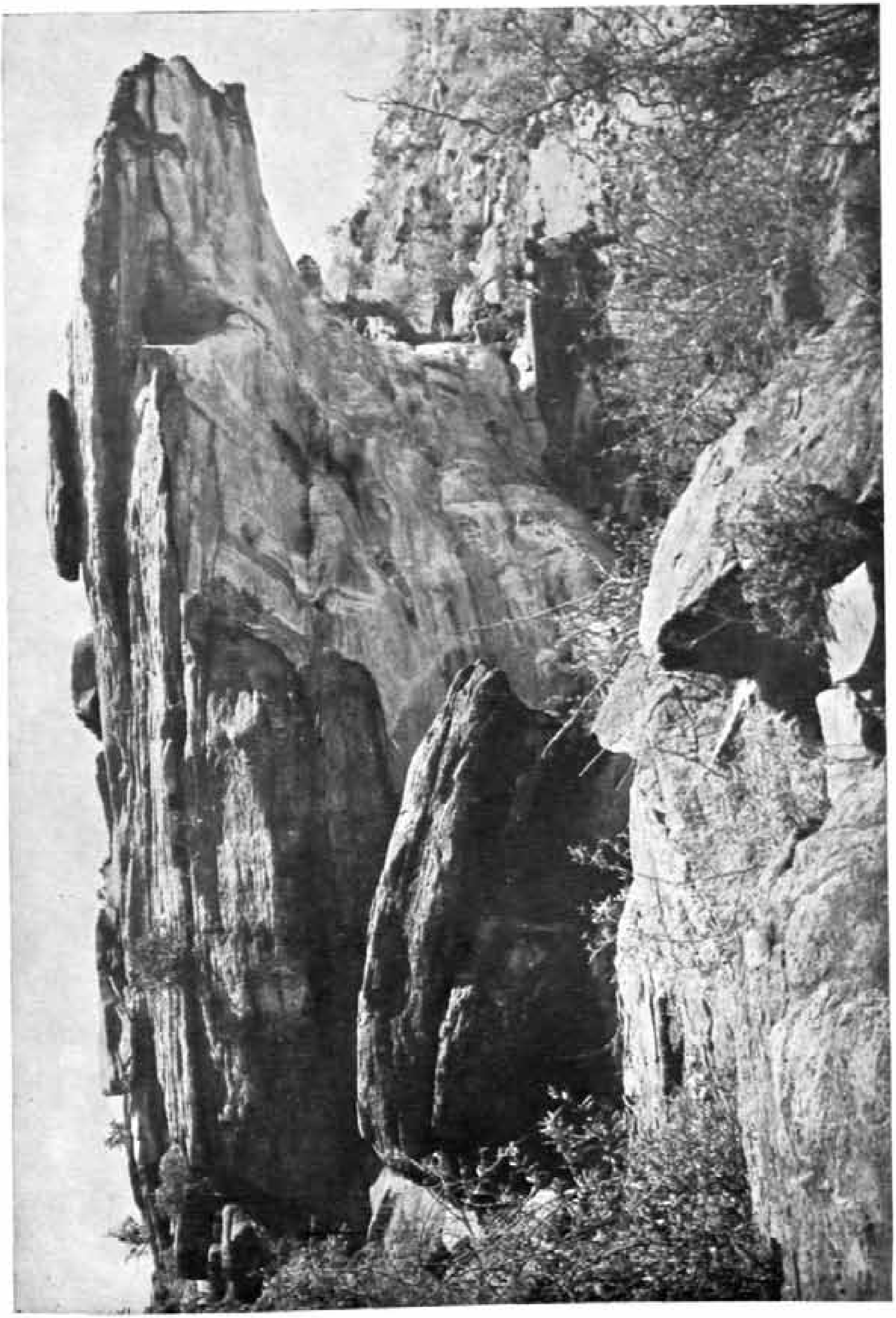
A



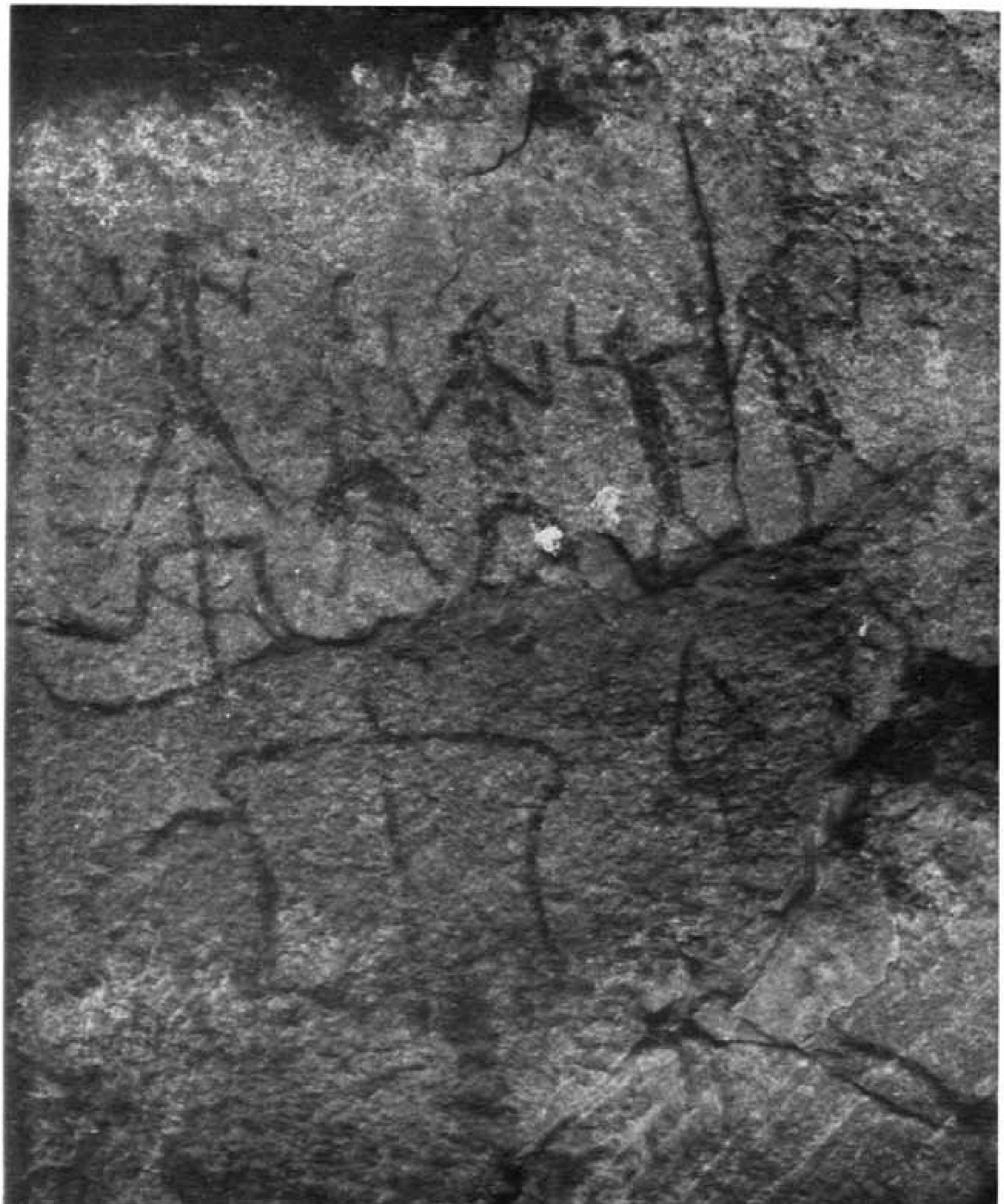
B



Pangoraria : A, *view of exposed stupa*; B, *close-view of chhatra recovered from debris of stupa.* *See p. 32*



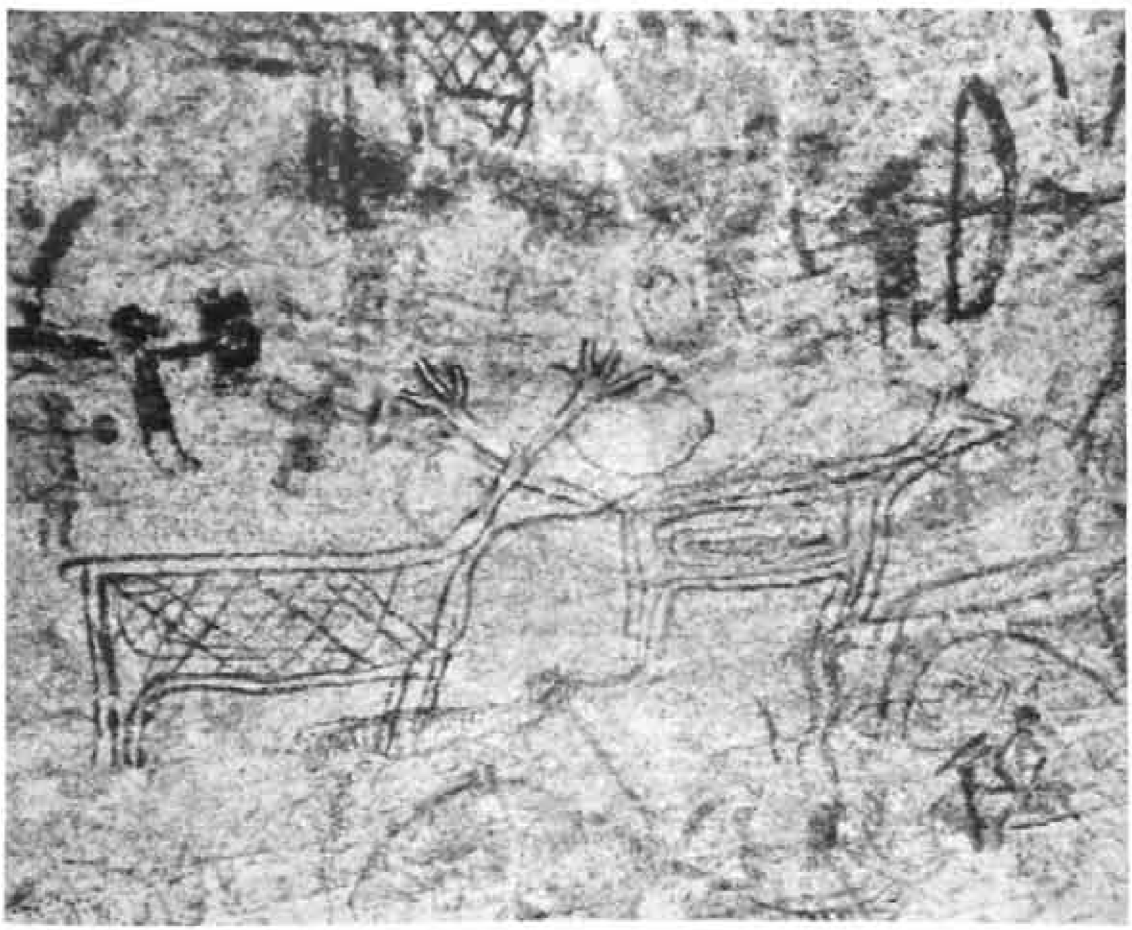
Ahamadpur : general view of rock-shelter. *See p. 32*



Alamadpur : rock-paintings of human figures, early phase. *See p. 33*



A



B

Ahamadpur : *rock-paintings*, A, *early phase*; B, *second phase*. *See p.* 33



A



B

Besnagar : exposed structures, A, Periods III and IV; B, Period IV. *See p. 33*



A



B



C

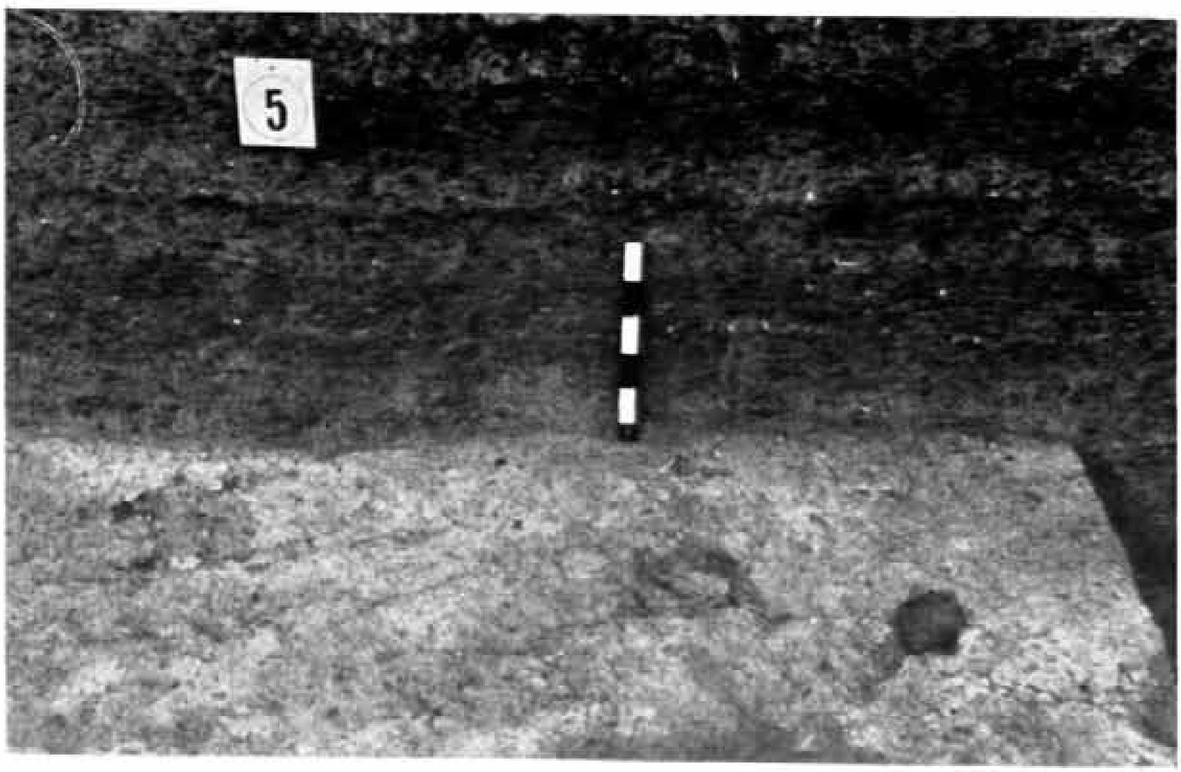


D

Besnagar : sculptures, Period IV B. *See p. 33*



A



B

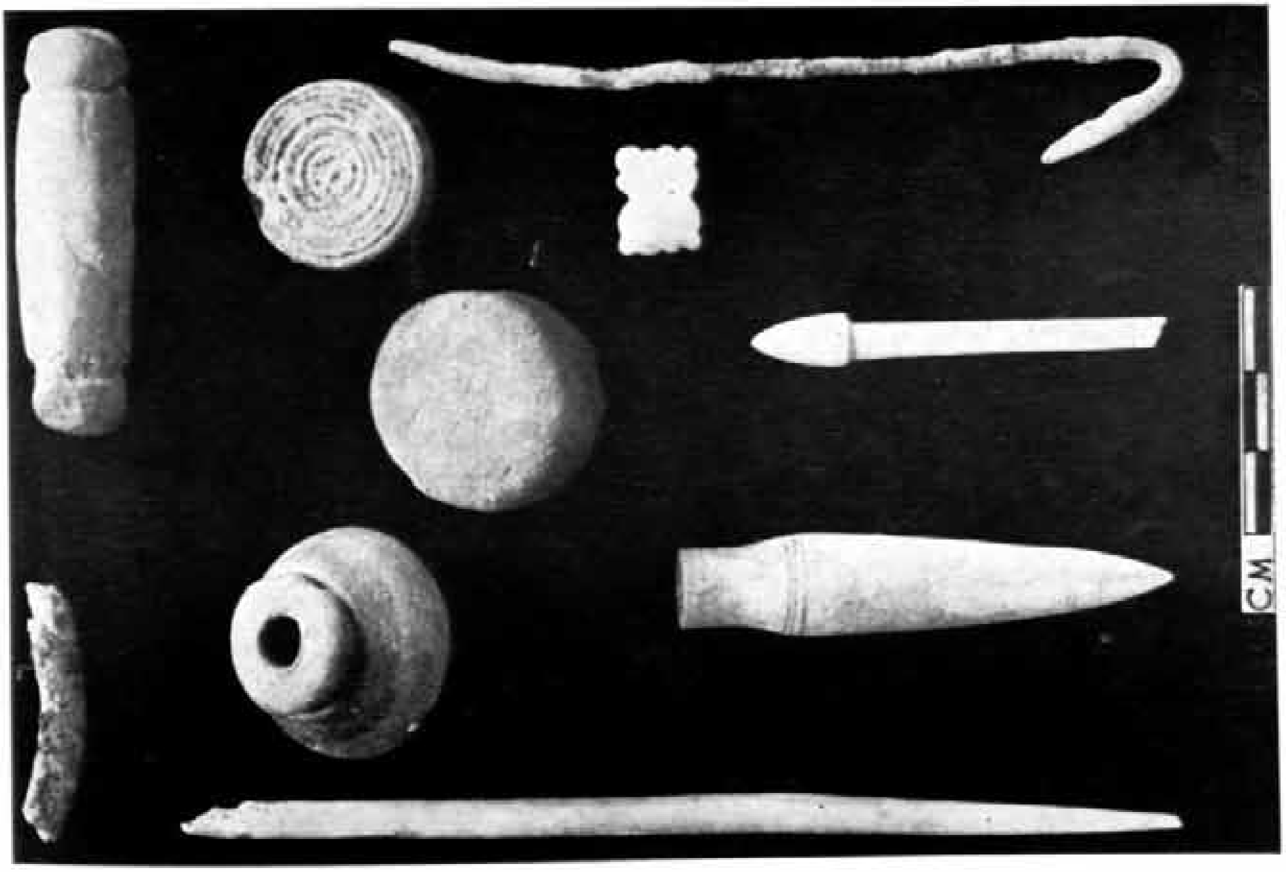
Apegaon : A, *painted pottery*; B, *exposed lime-plastered flooring with post-holes, Period I.* *See p. 39*



A



B



C

A, *Dadheri : painted and incised jar, Period II A; Nagar :* B, *terracotta sealing, Period II;* C, *antiquities, overlap phase.* *See pp. 42-43*



A



B

A, *Nagar* : *exposed mud-brick structure*; B, *Dadheri* : *view showing cultural sequence.* *See pp. 42-43*



A



B

Ghuram : A, general view of site; B, view of excavated trenches. *See p. 44*

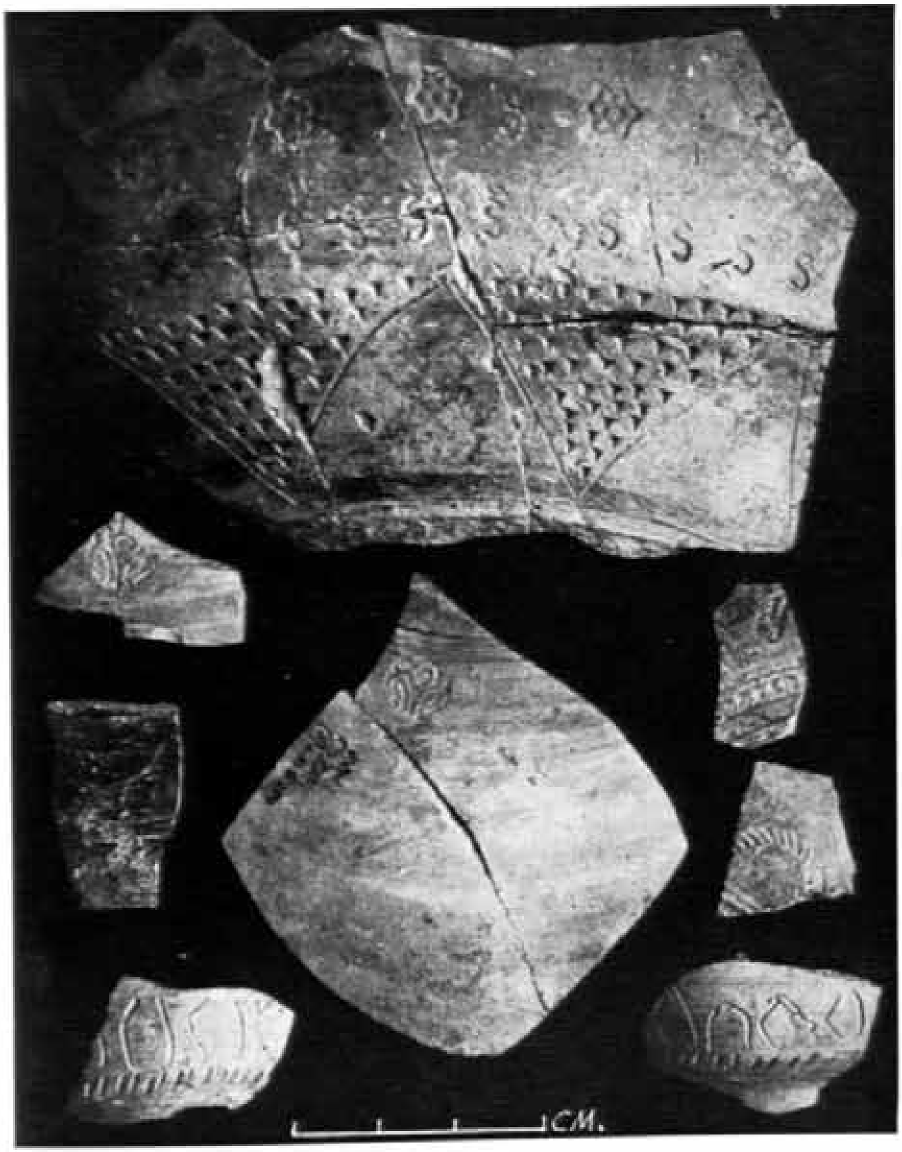
A



B



Ghuram : A, mud-brick structures, Period II A; B, baked brick structures, Period III A. See pp. 44-45



A



B

Ghuram : A, *pottery with incised and stamped designs, Period II B*; B, *inscribed terracotta object. See pp. 44-45*



B



A

Ghuram : A, *Seshasayi Vishnu*; B, *fragment of a pillar*. *See p. 45*

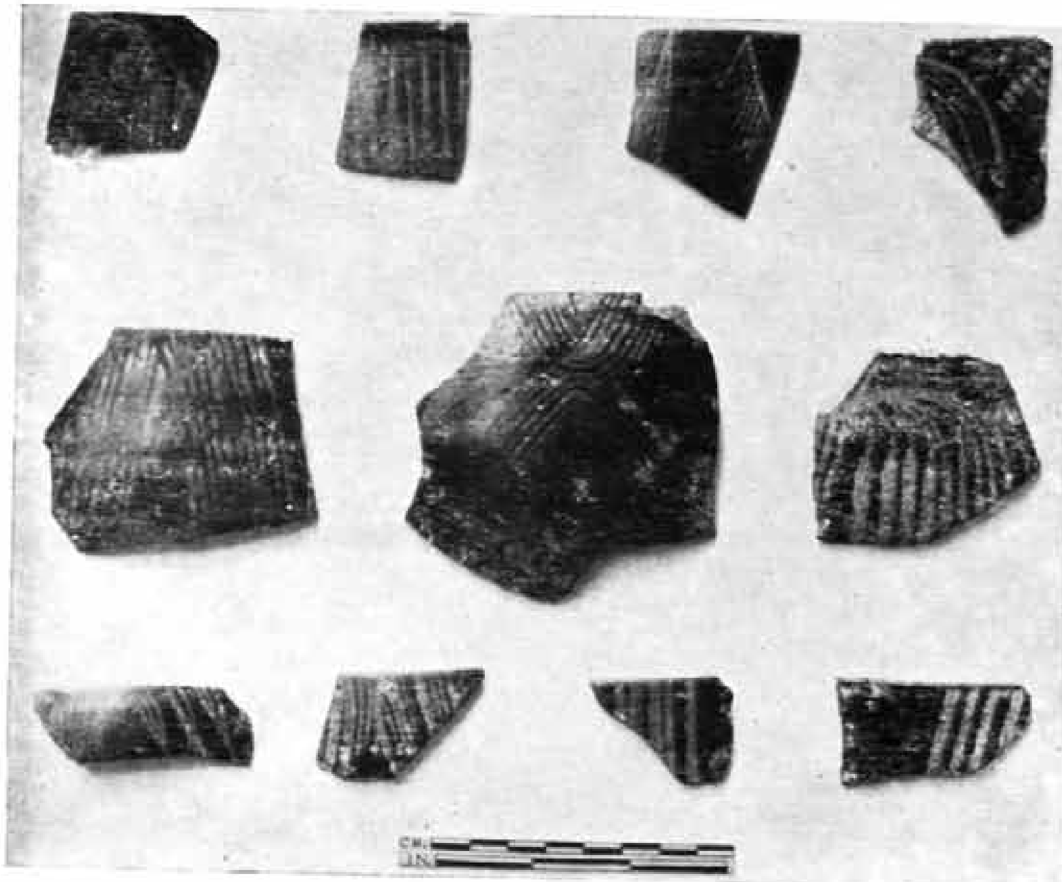


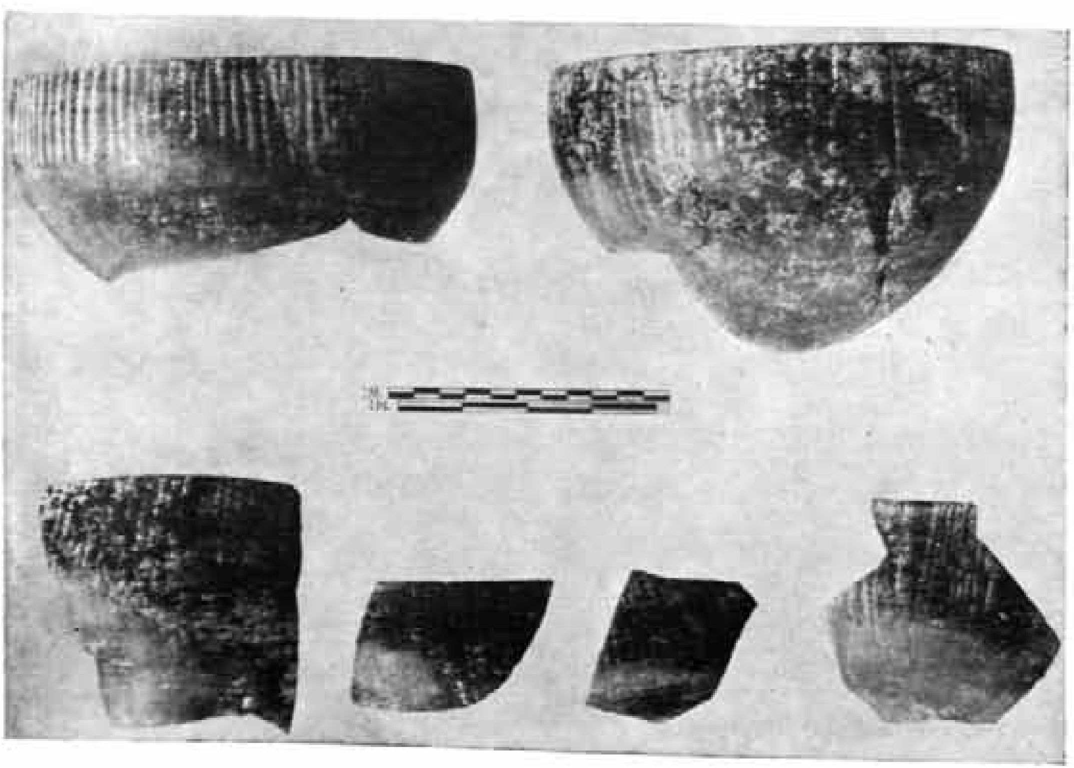
A



B

T. Kallupatti : A, *general view of site*; B, *exposed urns*. *See pp. 46-47*

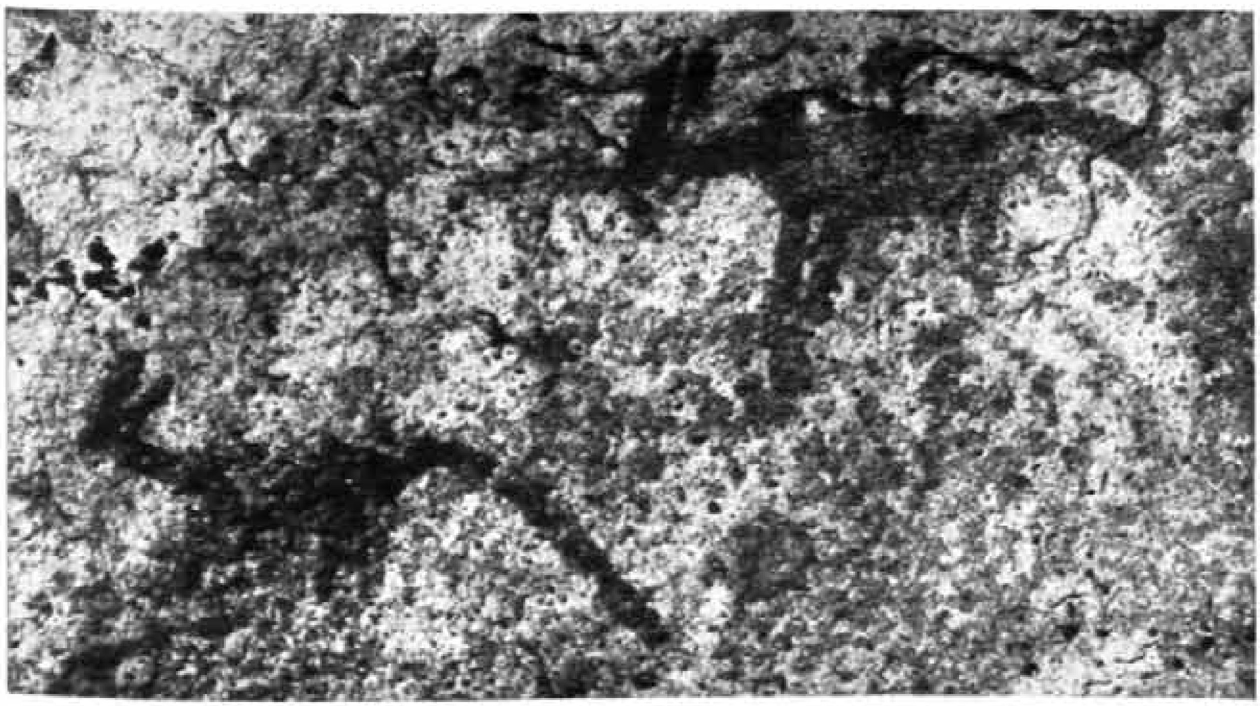

A


B

T. Kallupatti : A, *white-painted black ware*; B, *white-painted black-and-red ware*. *See p. 46*



A



B

Madanpura : A, *view of rock-shelter* 2; B, *paintings in rock-shelter*. *See p.* 48



Madanpura : *paintings in rock-shelter 1.* *See p. 48*



A

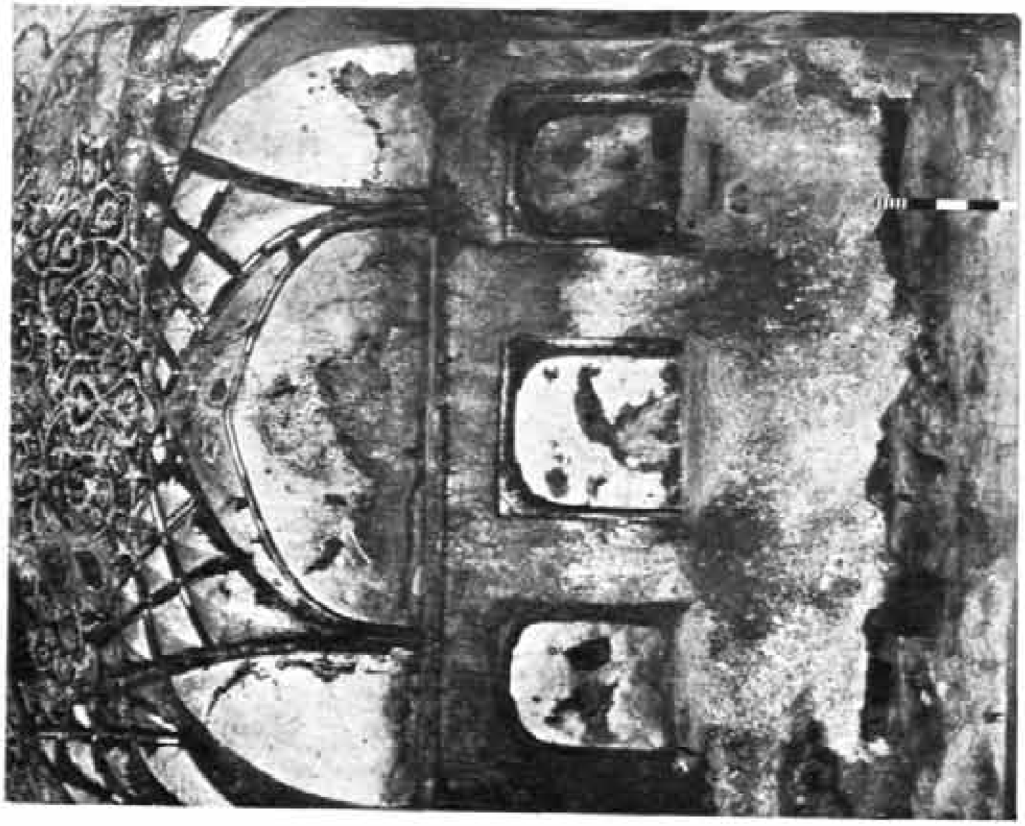


B

Fatehpur Sikri : exposed structures in Hammam complex. *See pp. 48-49*

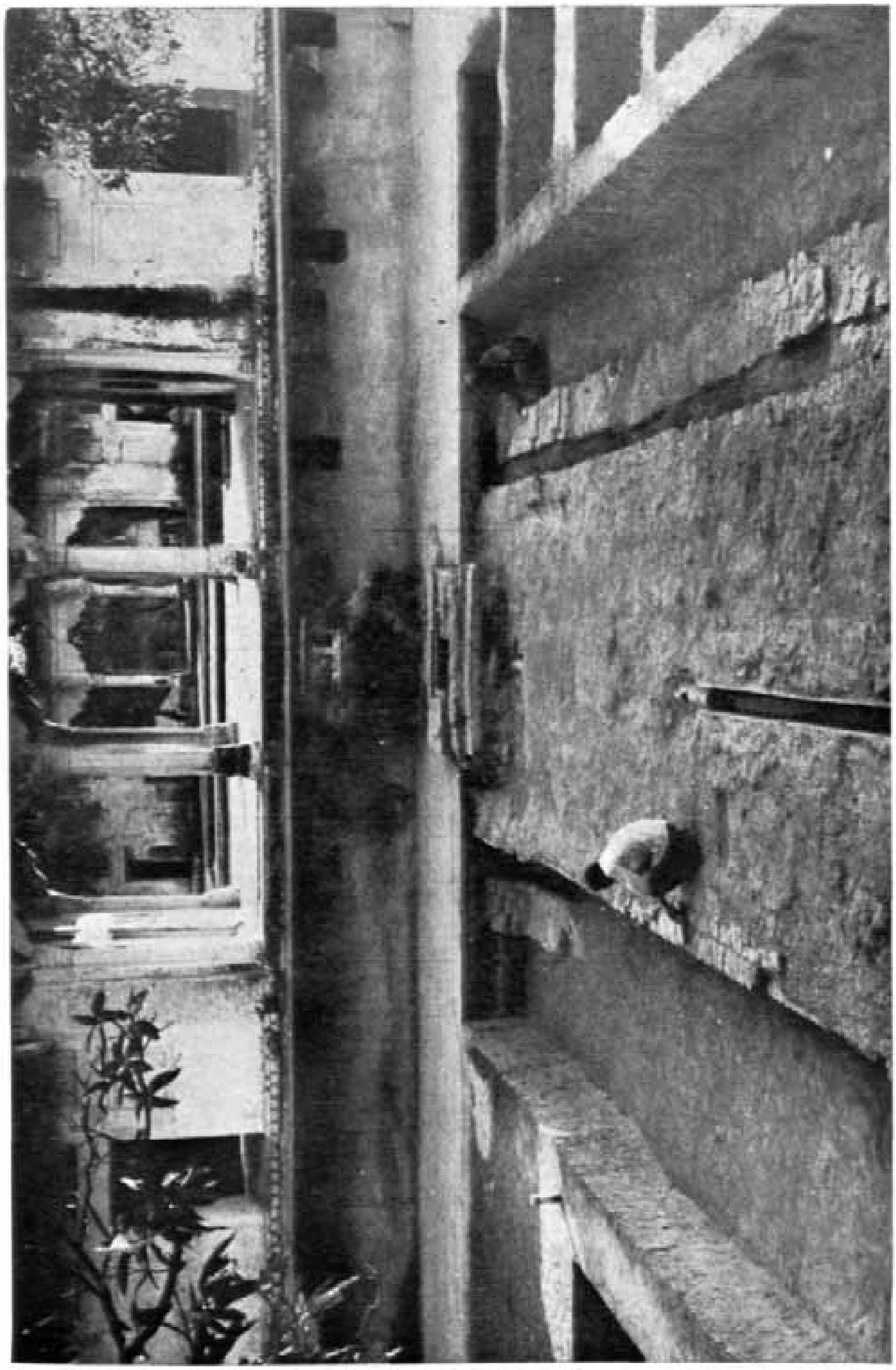


A

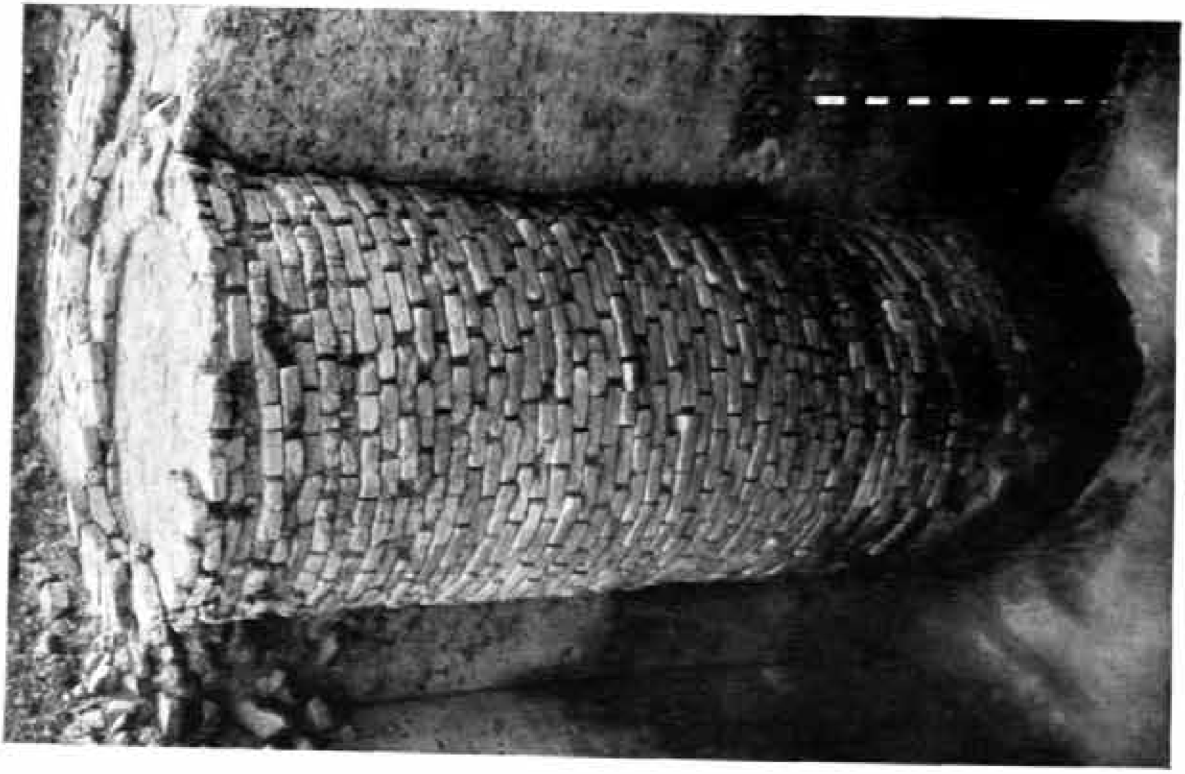


B

Fatehpur Sikri : exposed structures in Hammam complex. *See p. 48*



Rambagh : view of exposed structures. *See p. 49*



B



A

Ganwaria : A, *circular mud-wall*; B, *view of exposed well*. *See pp. 50-51*

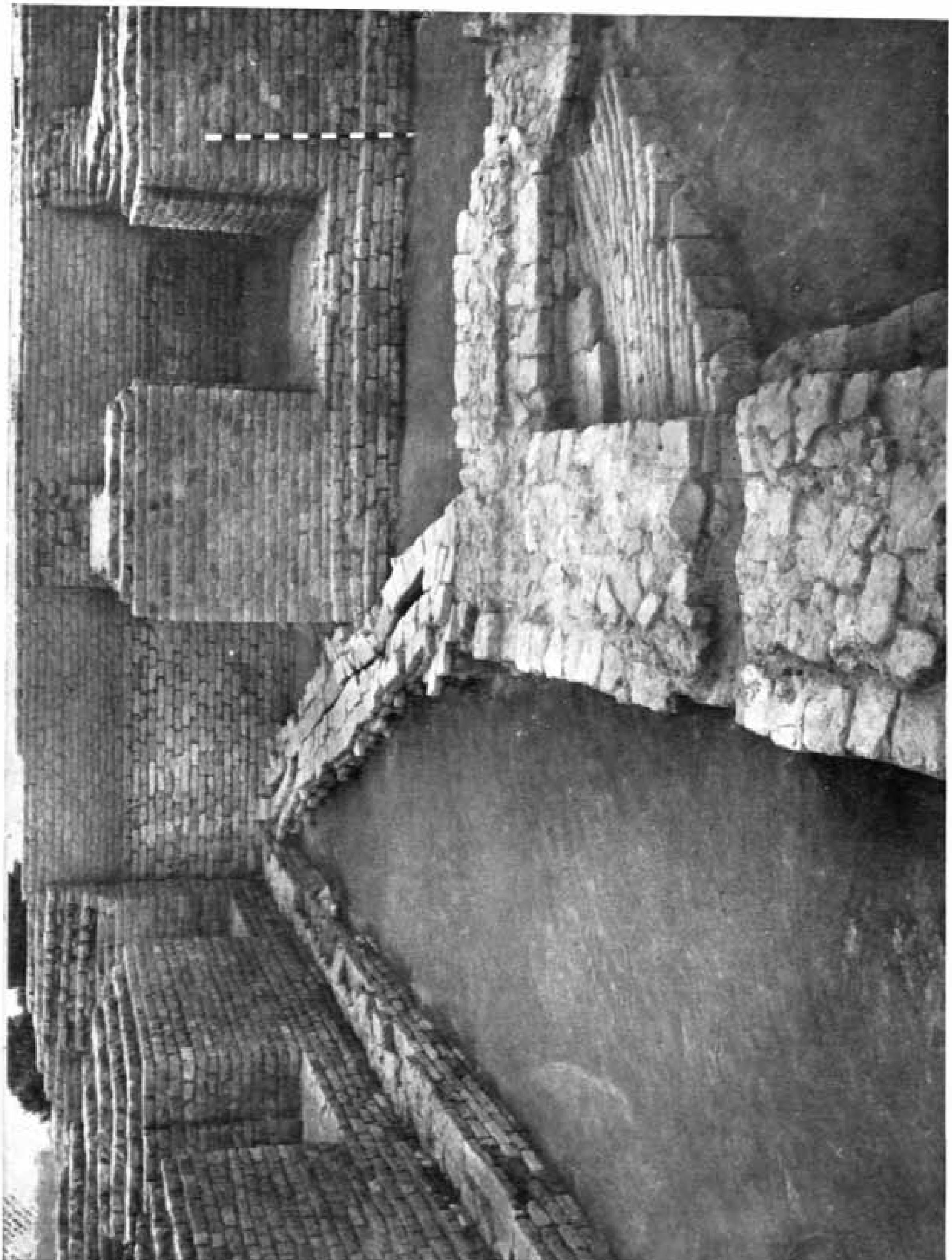


A



B

Ganwaria : A, *exposed house-complex*; B, *brick-paved courtyard and a well.* *See pp. 50-51*



Ganwaria : view of exposed structures. *See p. 50*



A

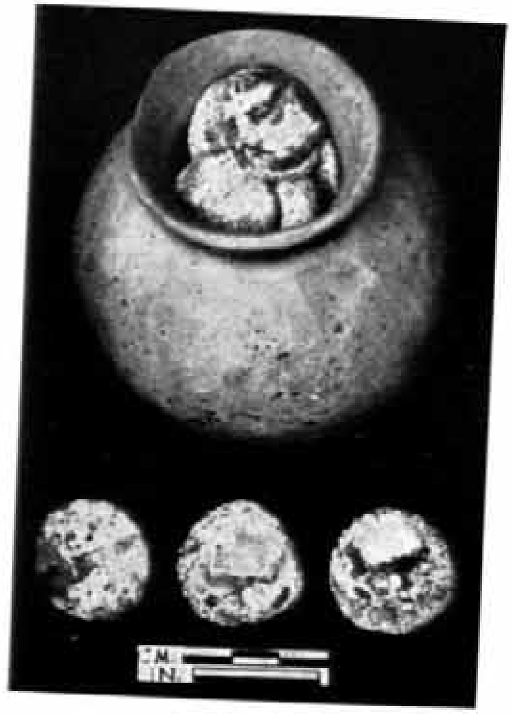


B

Ganwaria : A, *exposed cistern*; B, *view of house-complex below Shrine 2.* *See p. 51*



A



B

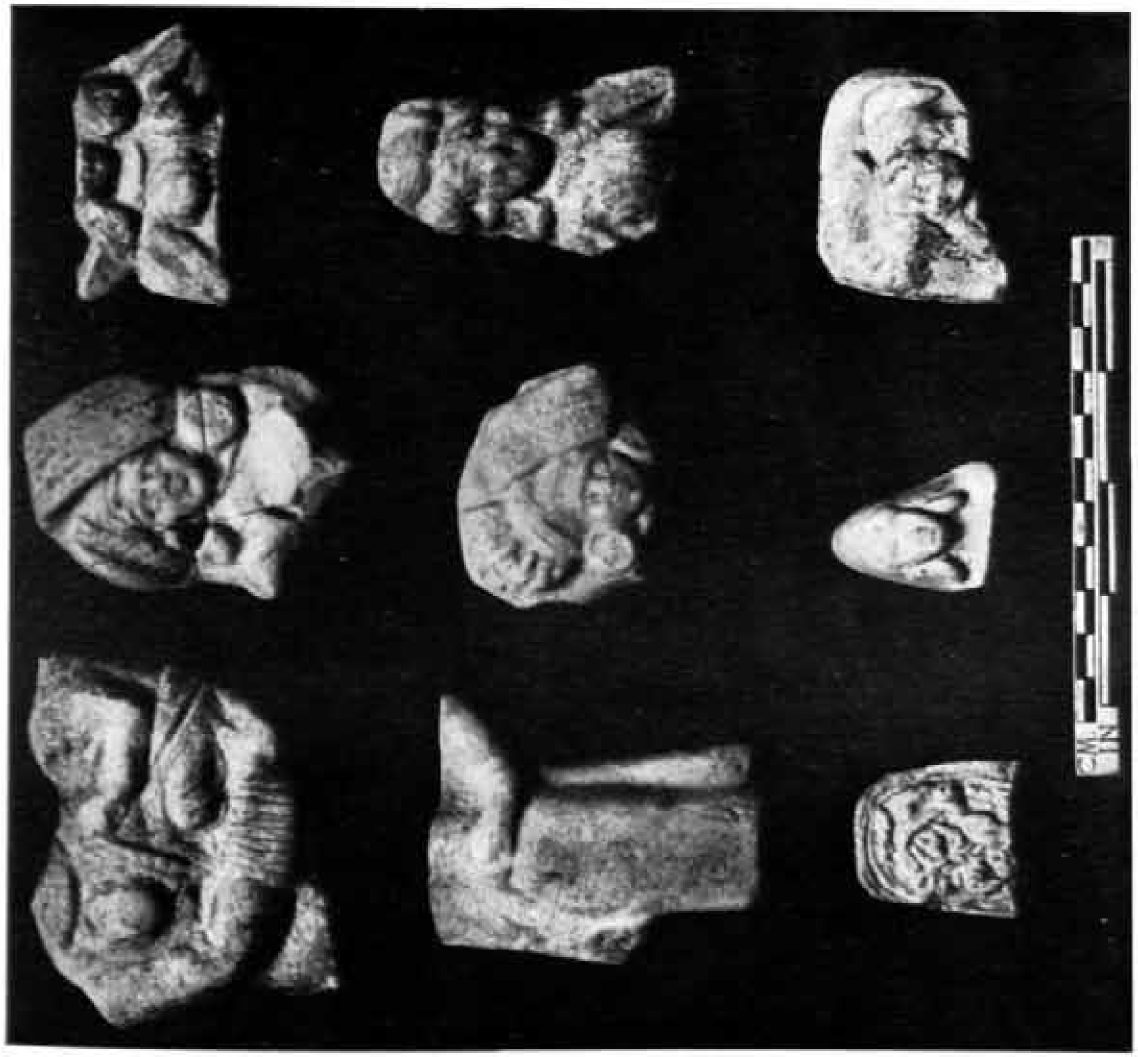


C



D

Ganwaria : A, *hoard of silver punch-marked coins*; B, *hoard of copper coins*; C, *terracotta objects*; D, *terracotta conch*. *See pp. 51-52*



B



A

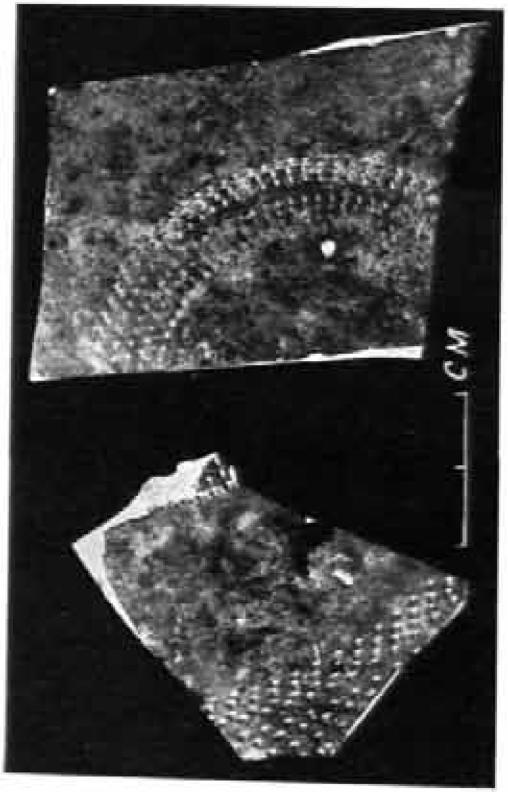
Ganwaria : A, *terracotta female figurine*; B, *terracotta human figurines.* *See p. 52*



Ganwaria : demons in terracotta. *See p. 52*



Ayodhya : view of excavated trench, Janma-bhumi site. *See p. 52*



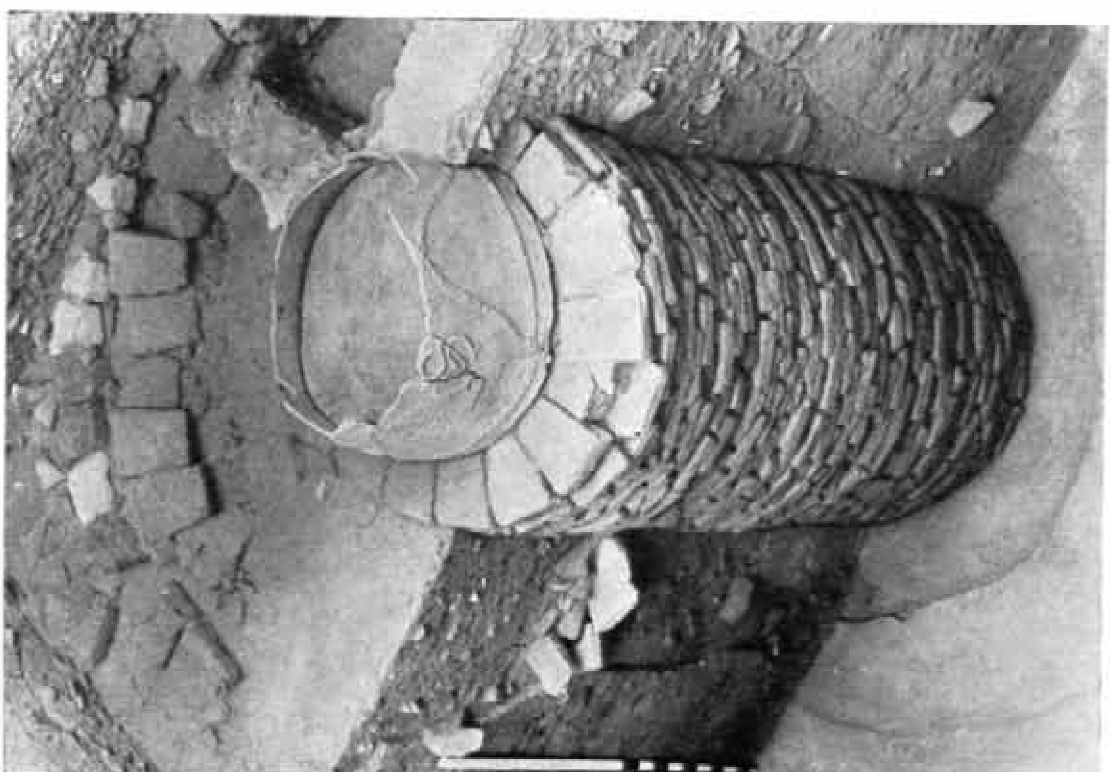
D



B



C



A

Ayodhya : A, *exposed well*; B, *terracotta sealing of Vayudeva*; C, *terracotta Jaina figure*; D, *Rouletted Ware. Period IV.* *See p. 53*



A



B



C



D

Mathura : A, *terracotta figurines of mother goddess, Period II*; B, *head of royal statue*; C, *human head (Kubera?), Period IV*; D, *Salabhanjika, Period IV*. *See p. 55*



A



B

Mathura : A, *exposed lime-plastered brick-floor, Period III*; B, *view of successive floors, Period IV.* *See p. 55*



A



B

Mathura : A, *view of mud-platforms, Period III*; B, *courtyard paved with brick-bats and bricks, Period III.* *See p. 55*



A



B



C



D



E

Mathura : sculptues of A, *lion, Period IV*; B, *elephant, Period IV*; C, *lion, Period III*; D, *door-jamb, Period IV*; E, *Vishnu, Period V.* *See p. 55*



A

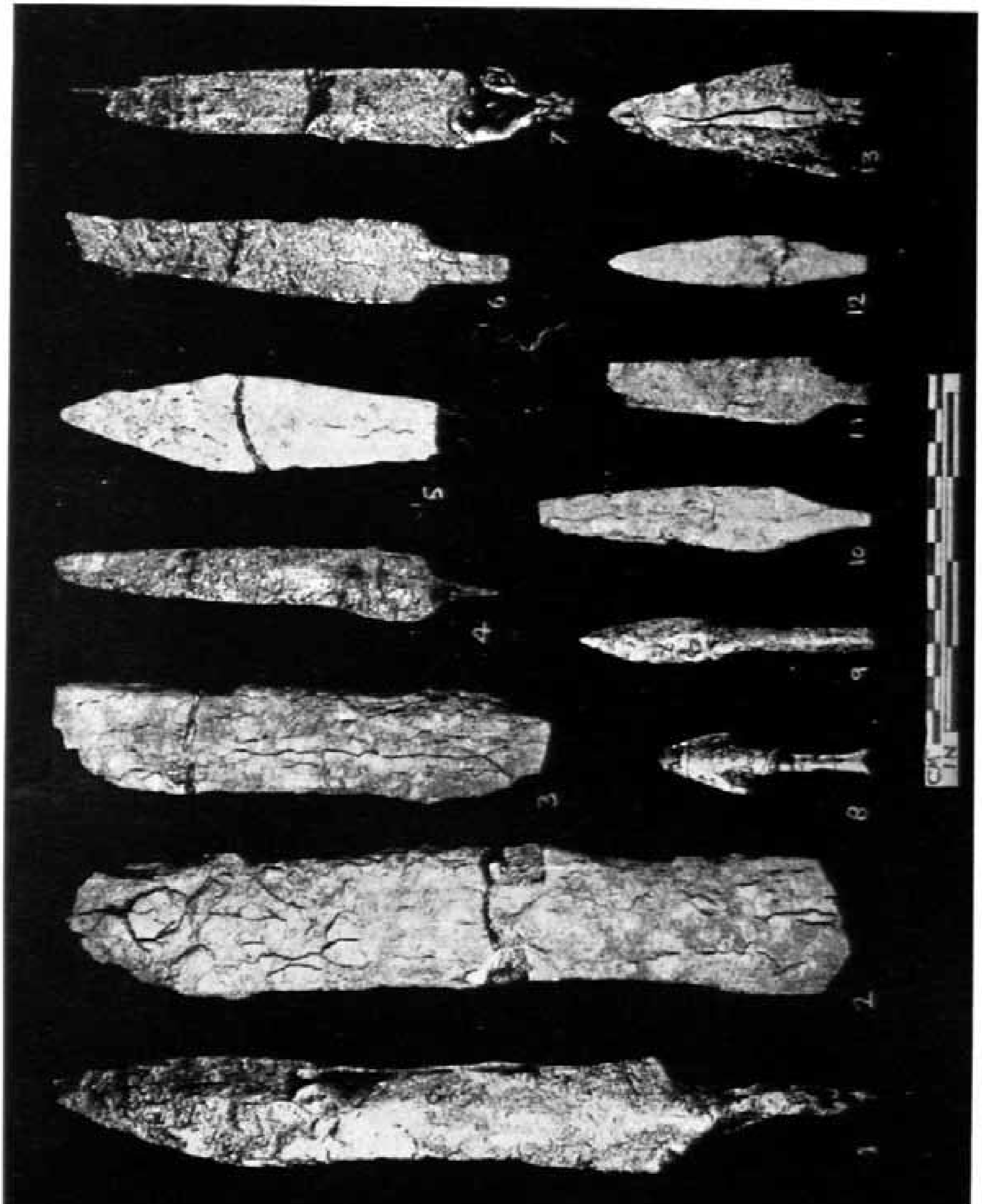


B

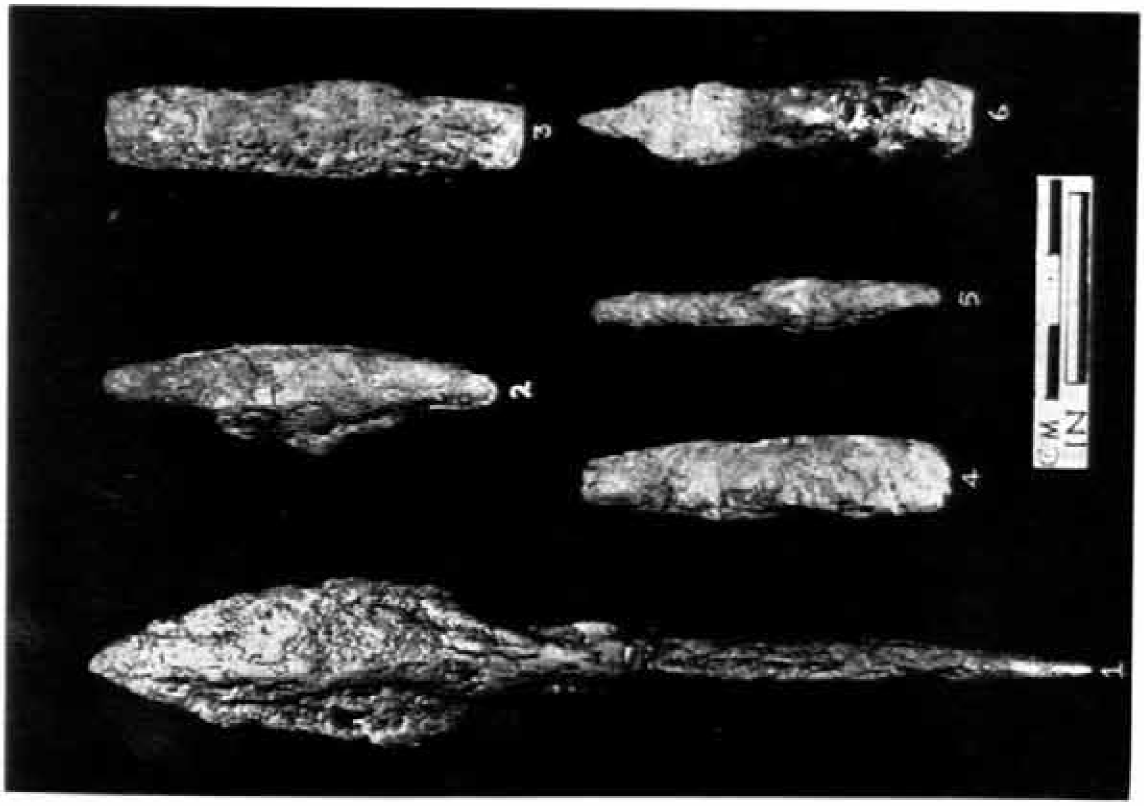


C

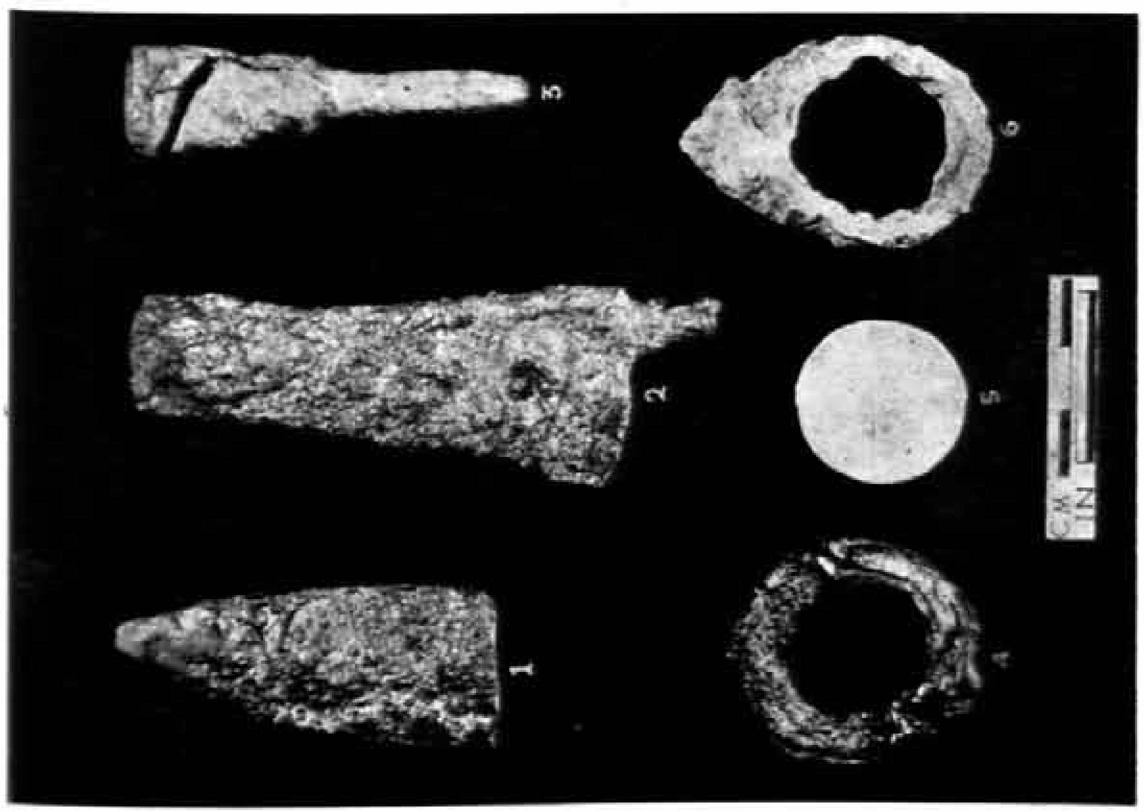
Mathura : A, *flaming Buddha, Period IV*; B, *head of Buddha, Period V*; C, *human (female)-shaped pendant, Period IV.* *See p. 55*



Mathura : iron objects. *See p. 55*

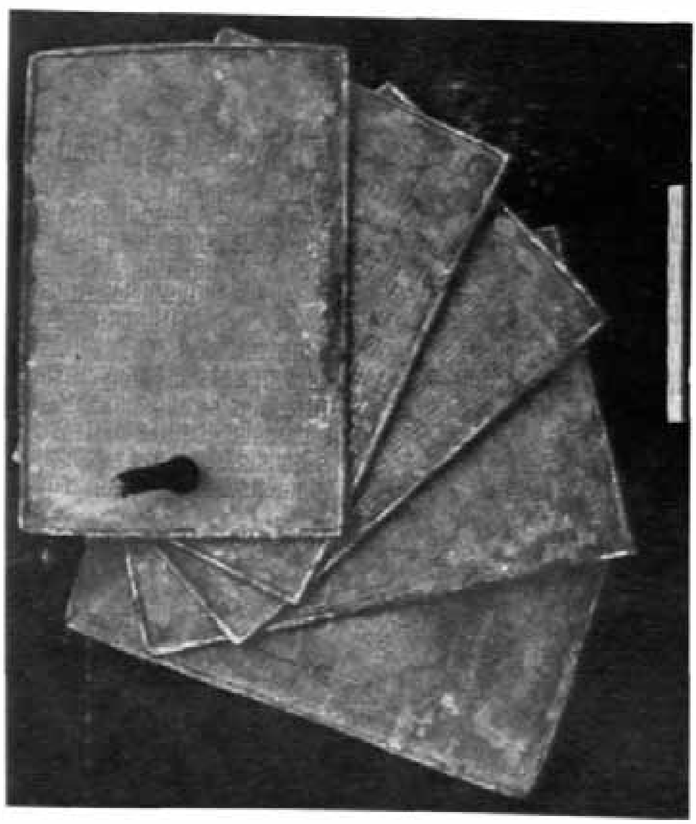


B



A

Mathura : iron objects. *See p. 55*



A

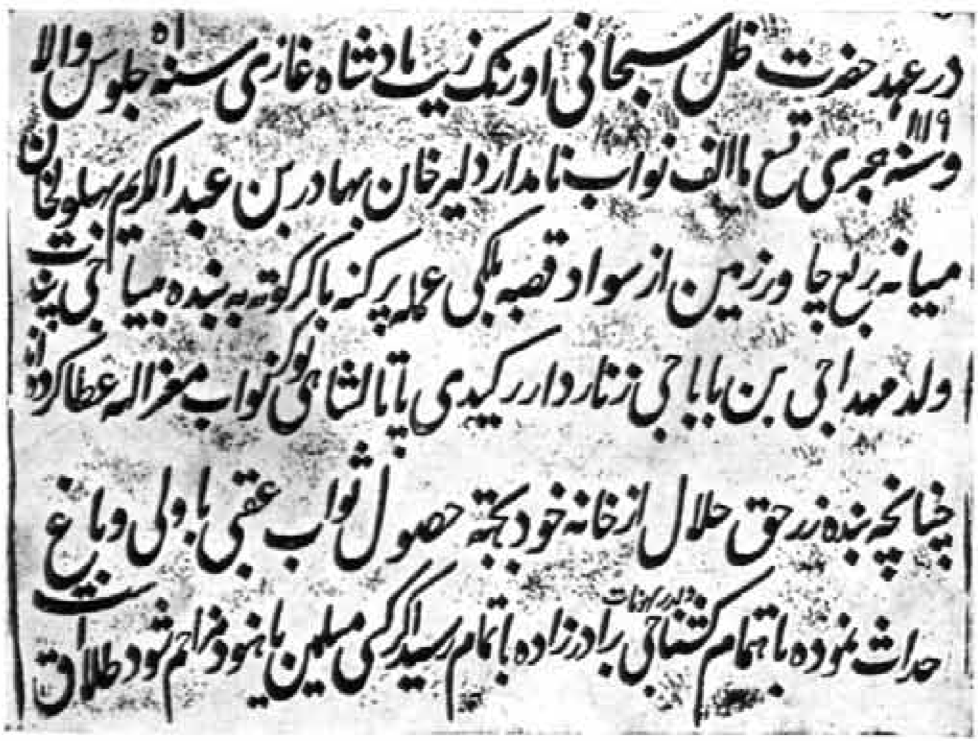


B

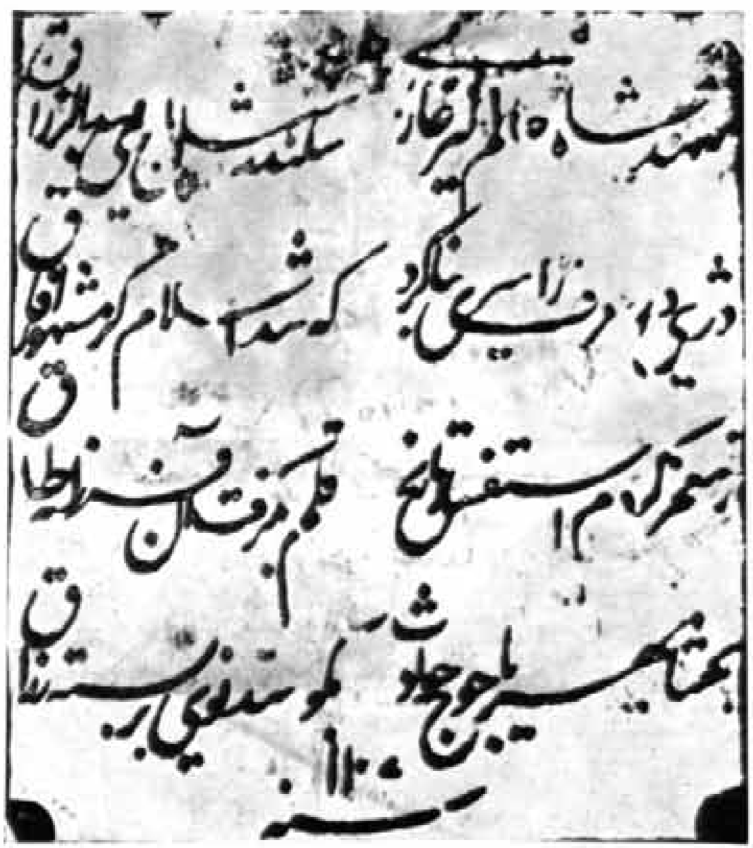


C

A, copper-plates of Hoysala king Narasimha III (A.D. 1219); B, copper-plates of Hoysala king Somesvara (A.D. 1165), both from Anekannambadi; C, Pangoraria : Brahmi inscription on a chhatri. See p. 60



A



B

Inscriptions of Mughals : A, *from Biligi*; B, *from Pachad*. *See p. 67*

A



B



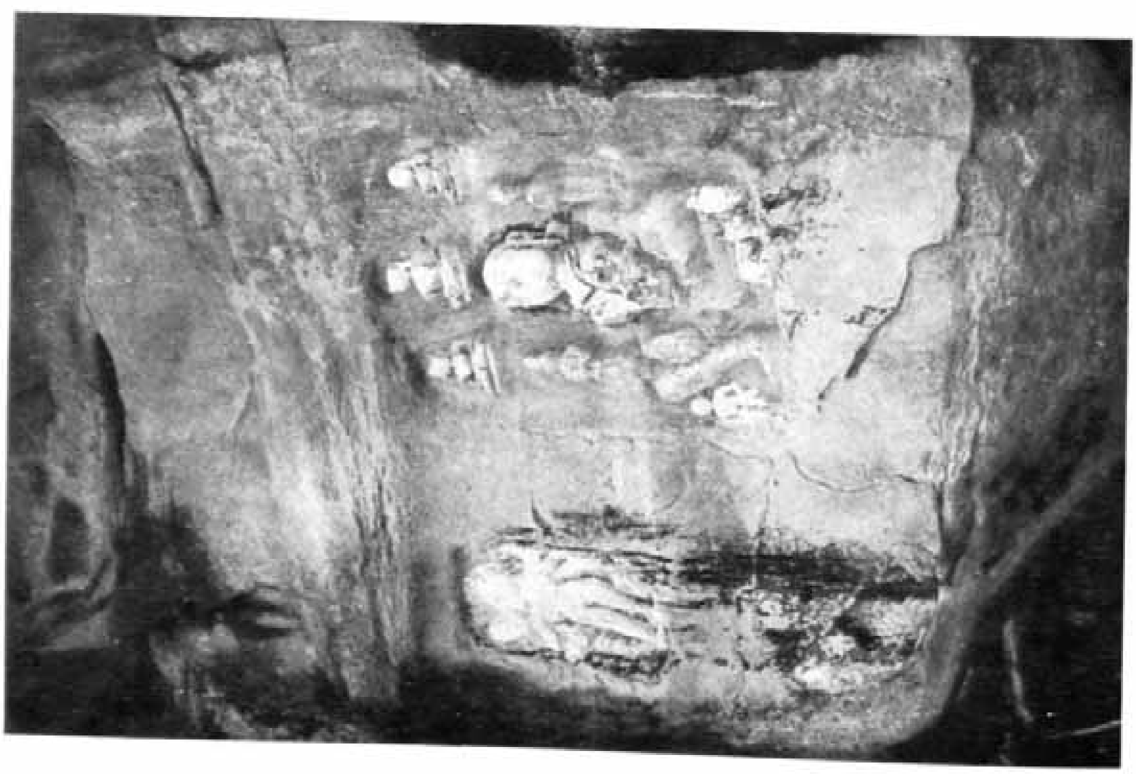
Akki Alur : Roman gold coins from a hoard. *See p. 71*



Hasnan : gold coins of Gupta period. *See p. 71*

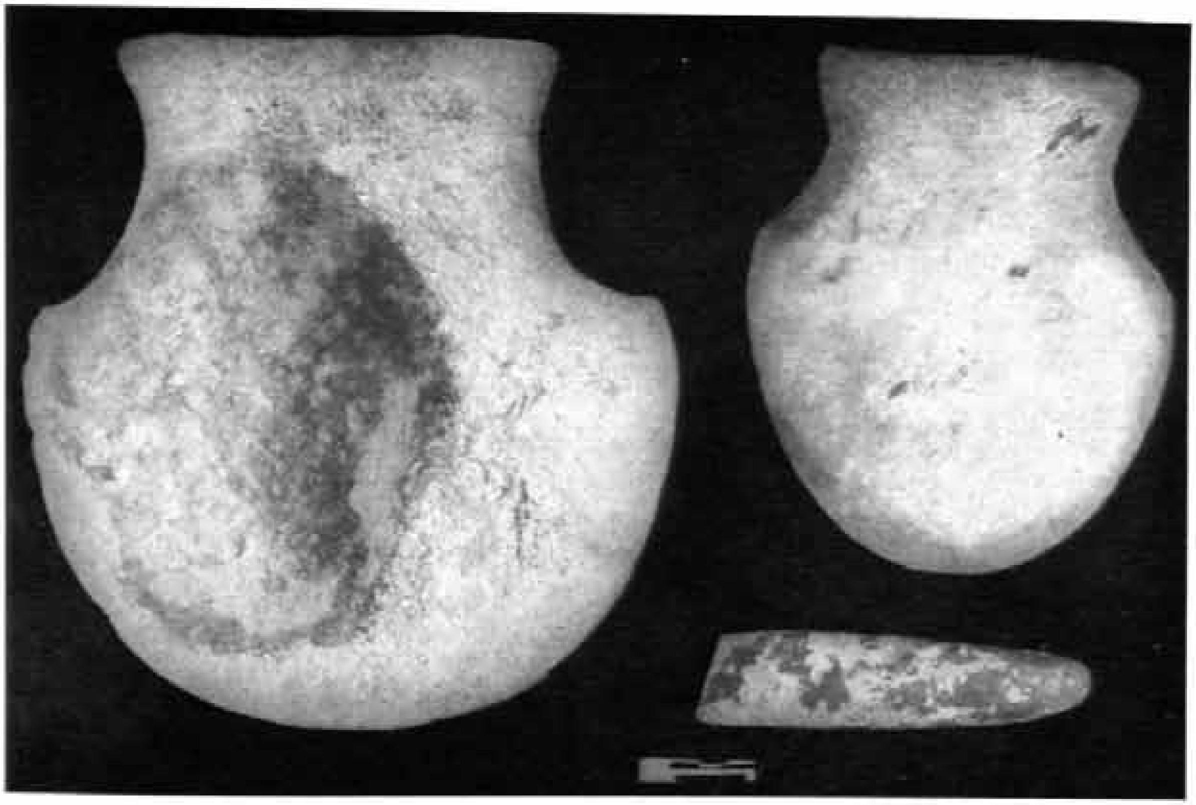


B

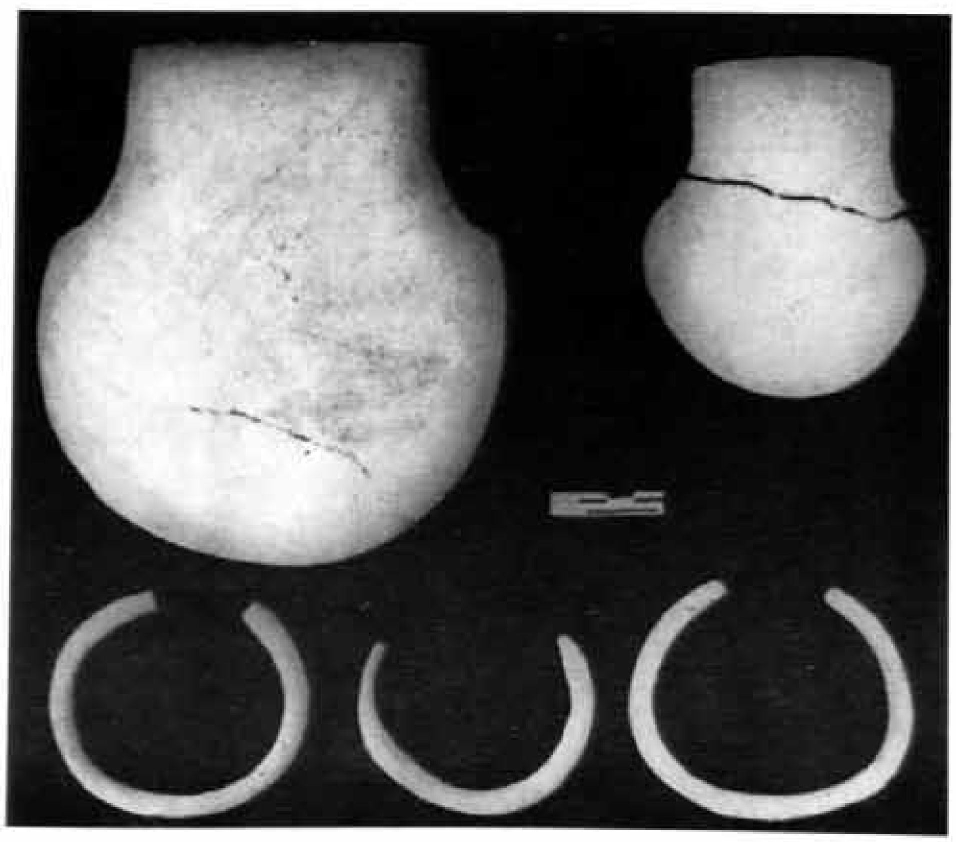


A

Rock-cut sculptures : A, *at Pachmarhi*; B, *at Sitatalai.* *See p.* 77



A



B

A, *Bhaktabundh* : *shouldered copper celts and a pick-like object*; B, *Aguibani* : *shouldered copper celts and rings.*
See p. 82





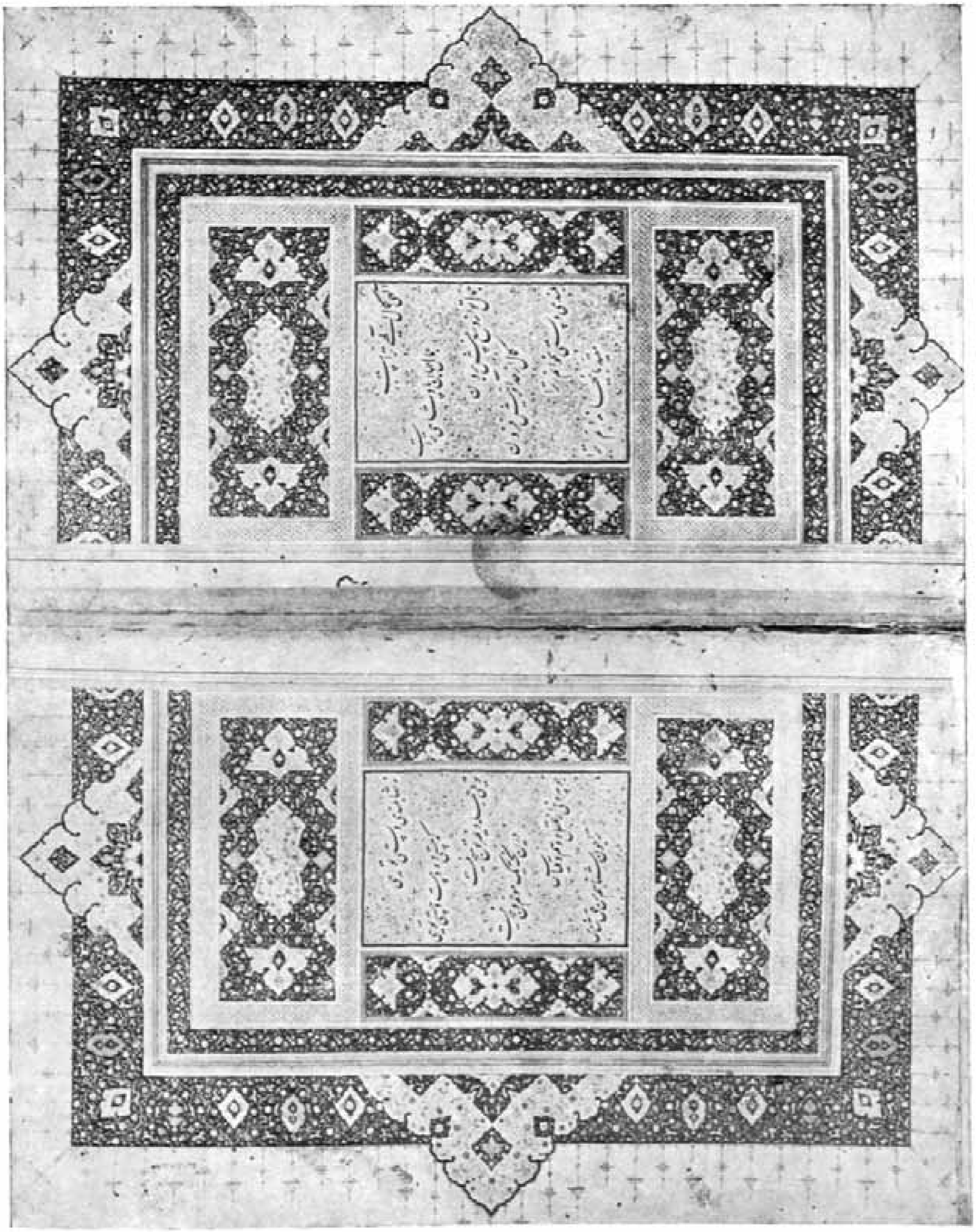
B



C

A

A, *Prince of Wales Museum, Bombay* : *image of Vishnu*; *Gaya Museum, Gaya* : B, *Vishnu*; C, *Varaha*. *See pp. 94-95*



Indian Museum, Calcutta : illuminated manuscript of Khiradnama Sikandari. See p. 94



A



B

A, *Archaeological Museum, Hampi* : *reorganized gallery*; B, *Archaeological Museum, Vaishali* : *reorganized gallery*.
See pp. 95 and 98



A



B

National Museum, New Delhi : A, *image of Nataraja, Gupta period*; B, *terracotta toy-cart, Sunga period.* *See p. 97*



B



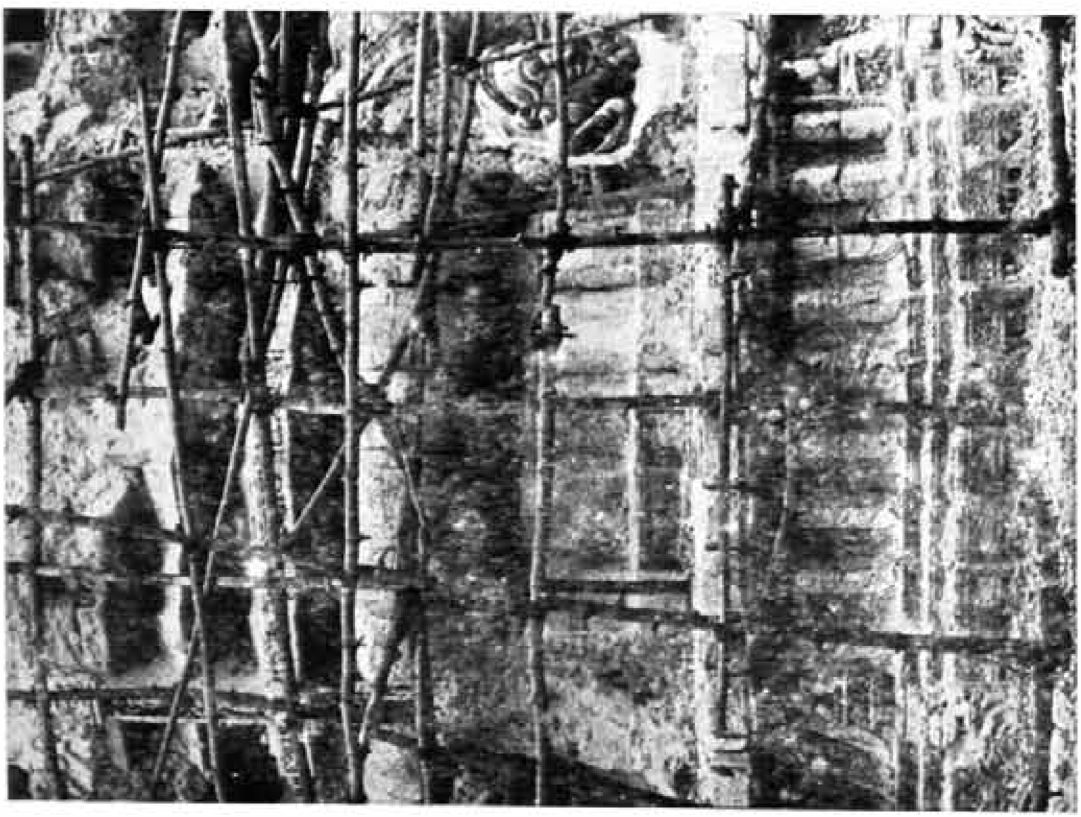
A

National Museum, New Delhi : A, image of dvarapala, Gupta period, B, Harihara, seventh century A.D. See p. 97

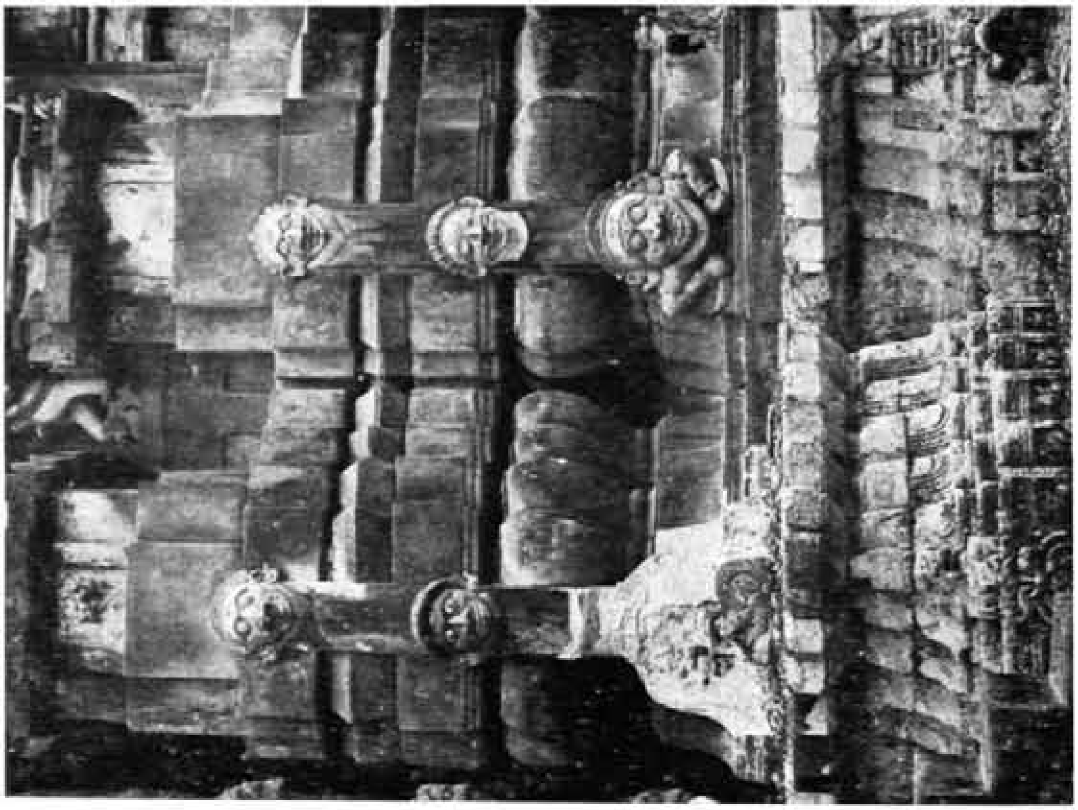




A, *Museum and Picture Gallery, Vadodara : image of a Saivite deity*; B, *Archaeological Museum, Vaishali : terracotta figurine of Mahishamardini.* *See p.* 98



A



B

Puri, Jagannath temple-complex : A, before and B, after removal of plaster. *See p. 106*



A

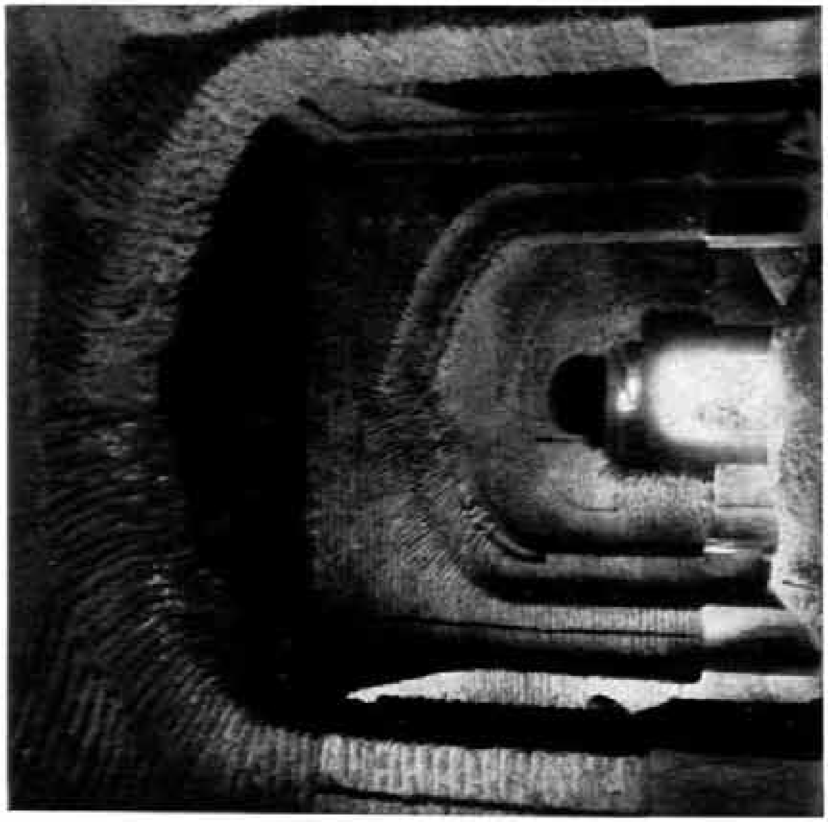


B

Puri, Jagannath temple-complex : A, *before and* B, *after removal of plaster.* *See p. 106*

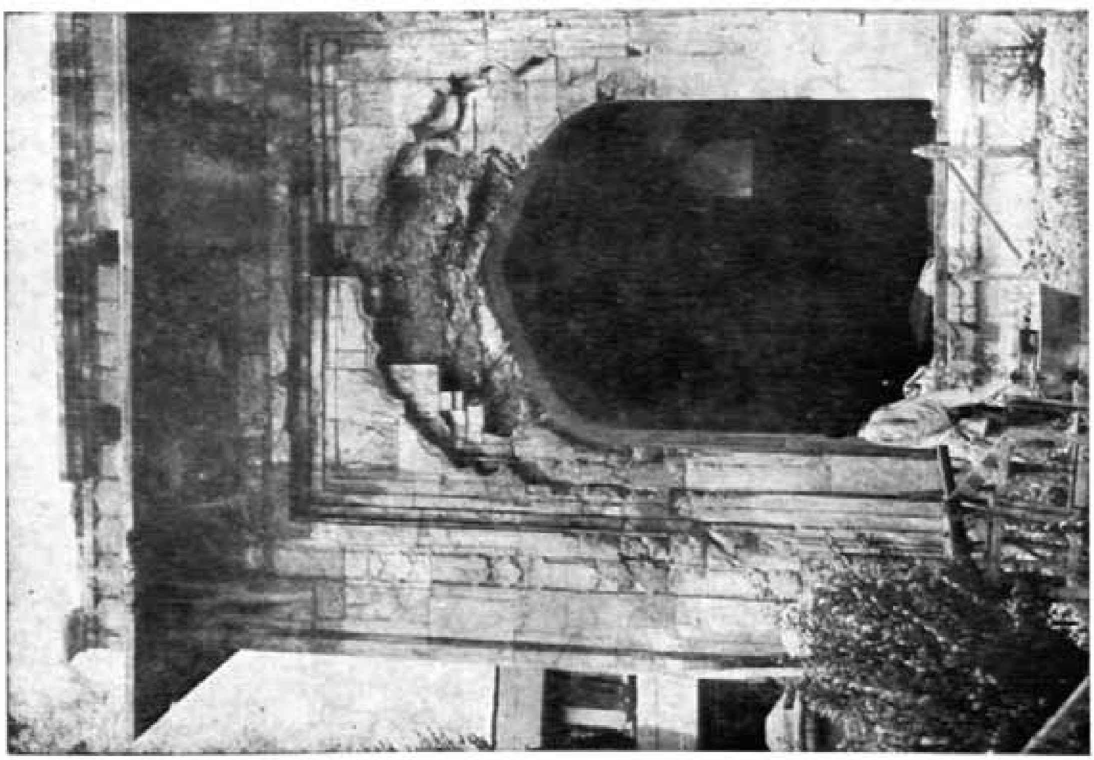


A

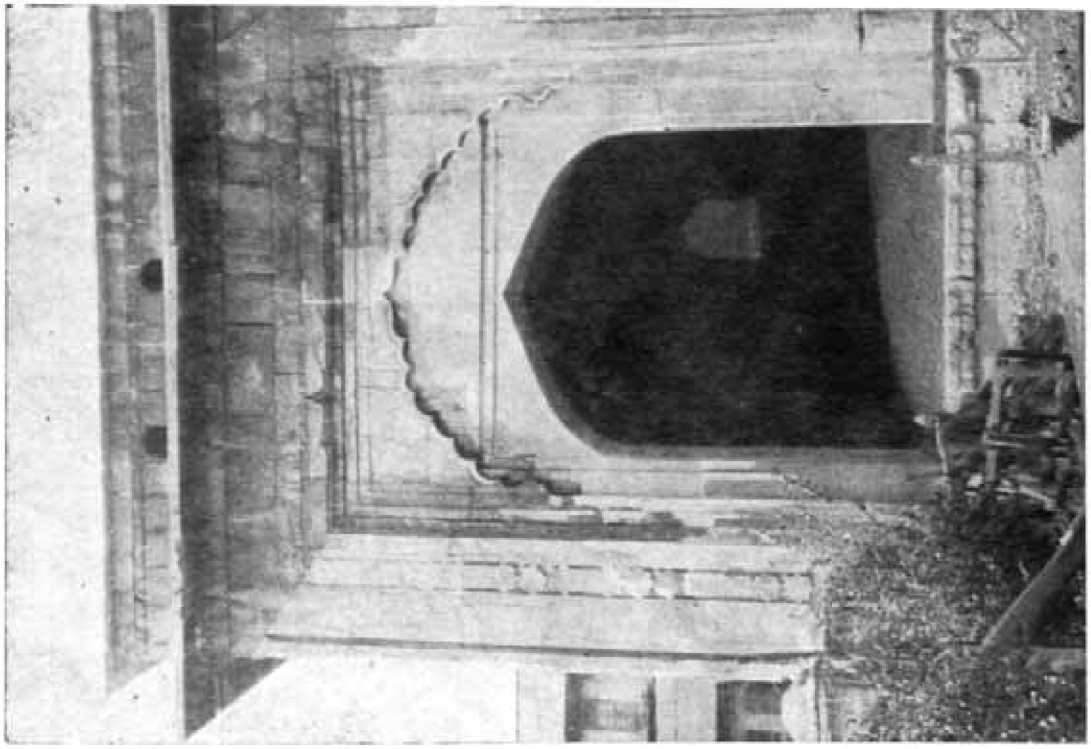


B

Harwan, Buddhist site : A, before and B, after conservation. *See p. 108*

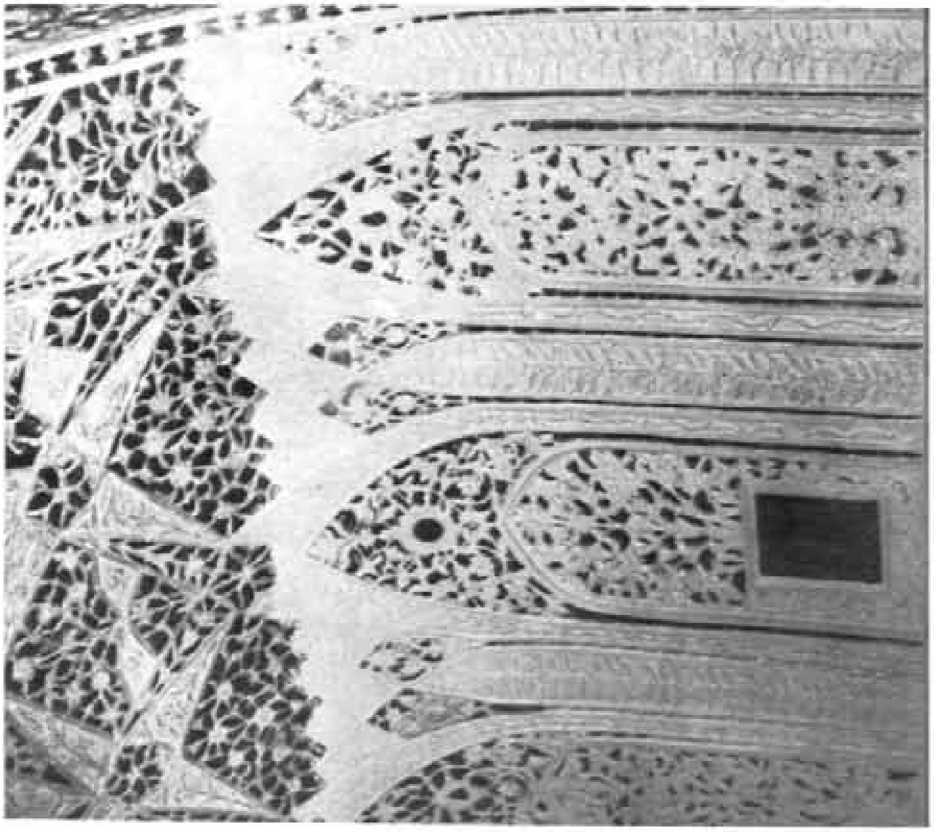


A

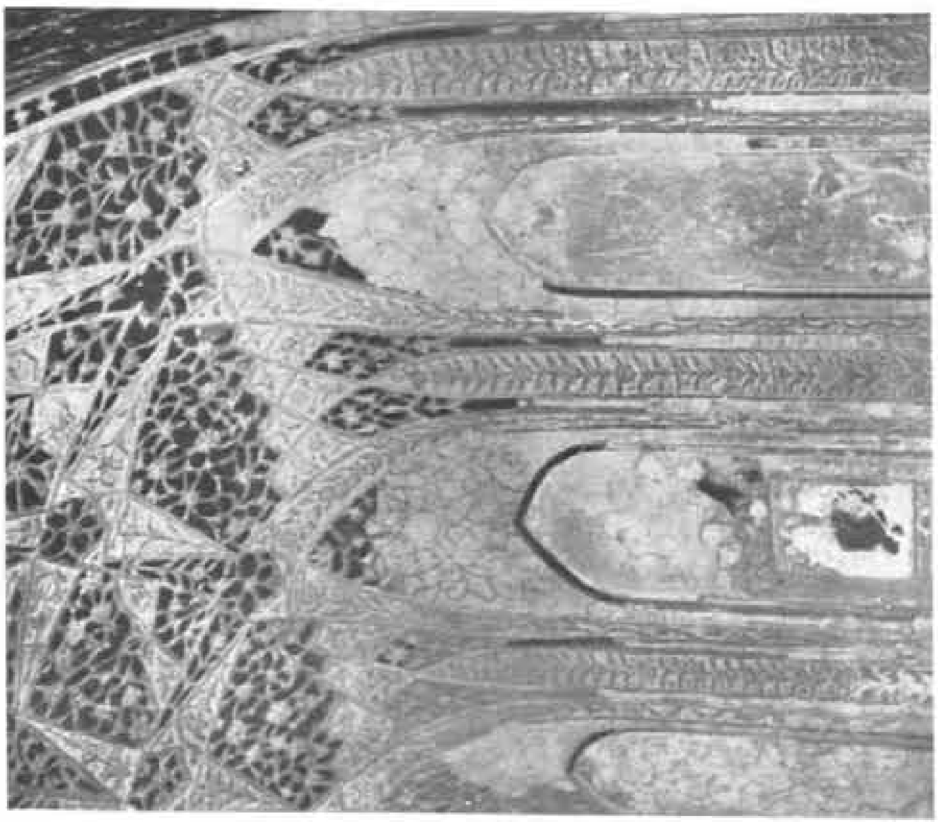


B

Srinagar, Pathar Masjid : A, *before and* B, *after conservation.* *See p. 108*

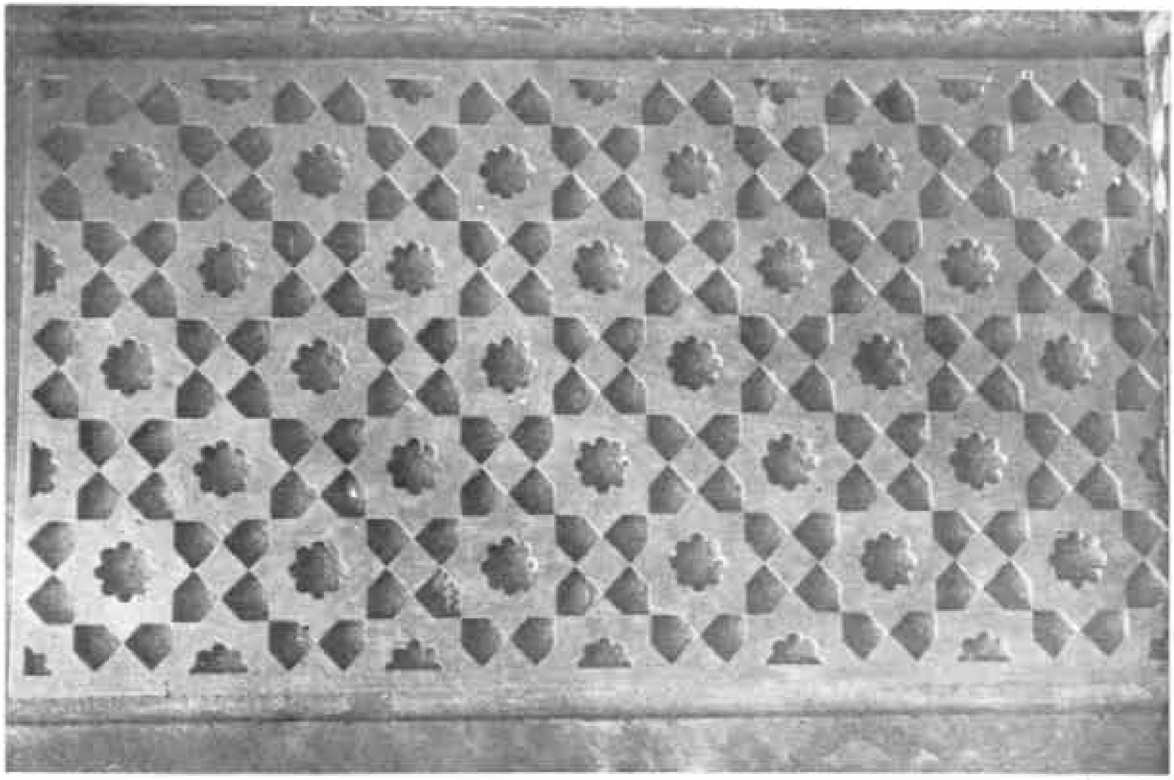


B

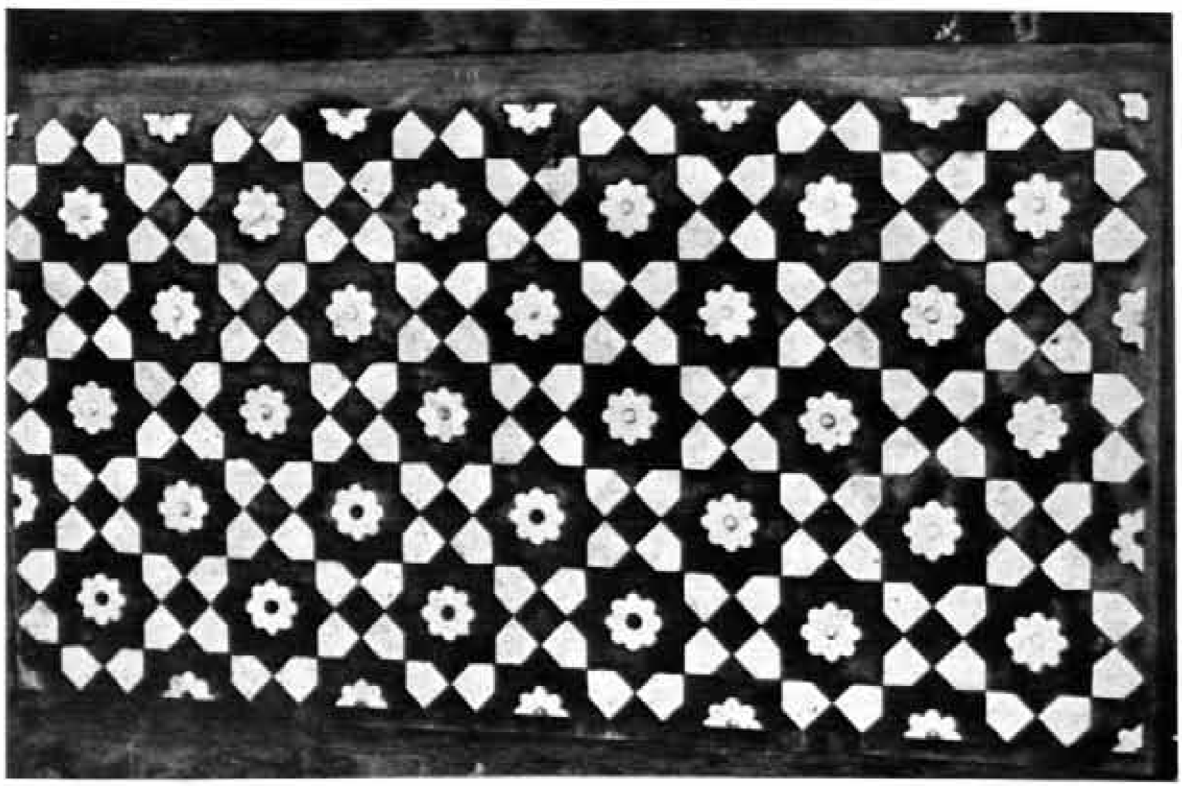


A

Agra, fort : A, before and B, after conservation. *See p. 109*

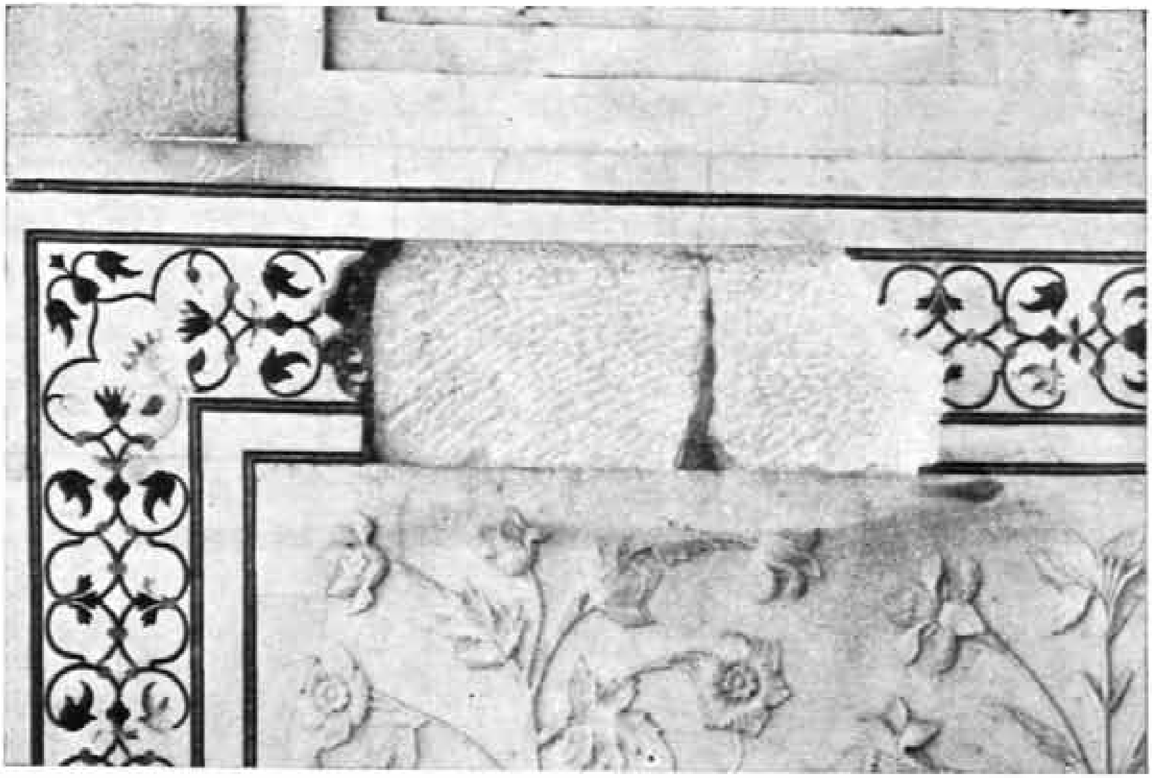


A

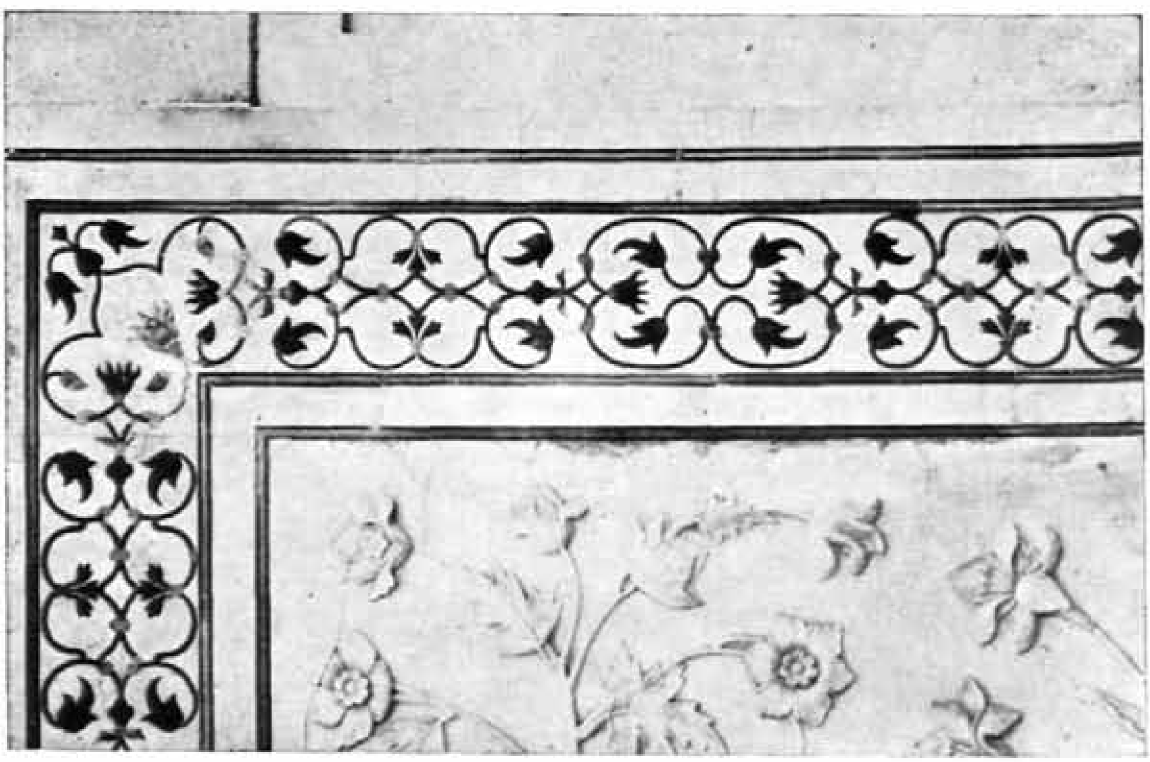


B

Agra, Itmad-ud-Daula's tomb : A, *before and* B, *after conservation.* *See p. 110*



A



B

Agra, Taj Mahal : A, before and B, after conservation. *See p. 110*

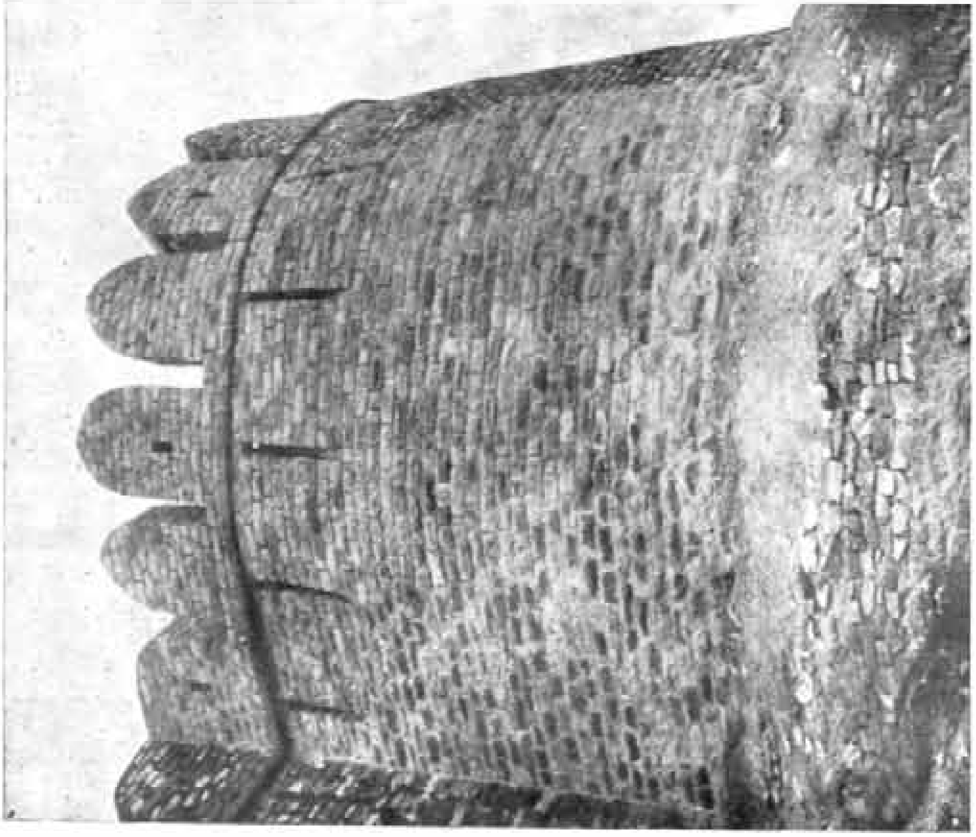


A

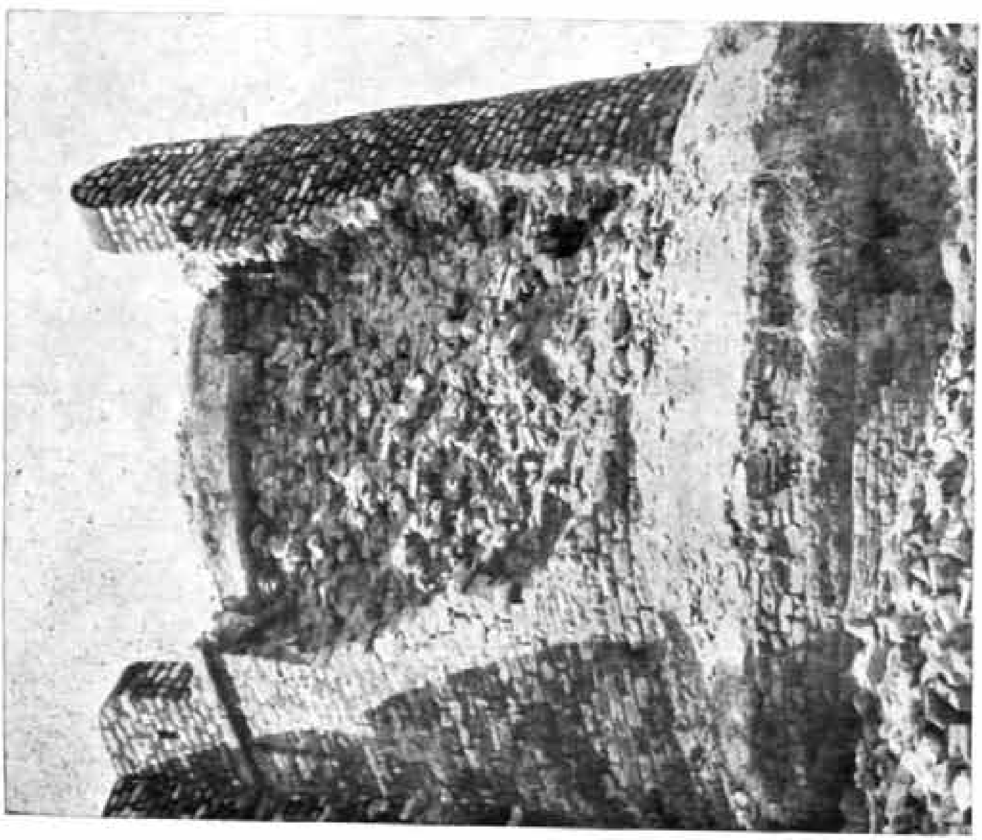


B

Fatehpur Sikri, Mint house : A, *before and* B, *after conservation.* *See p. 111*

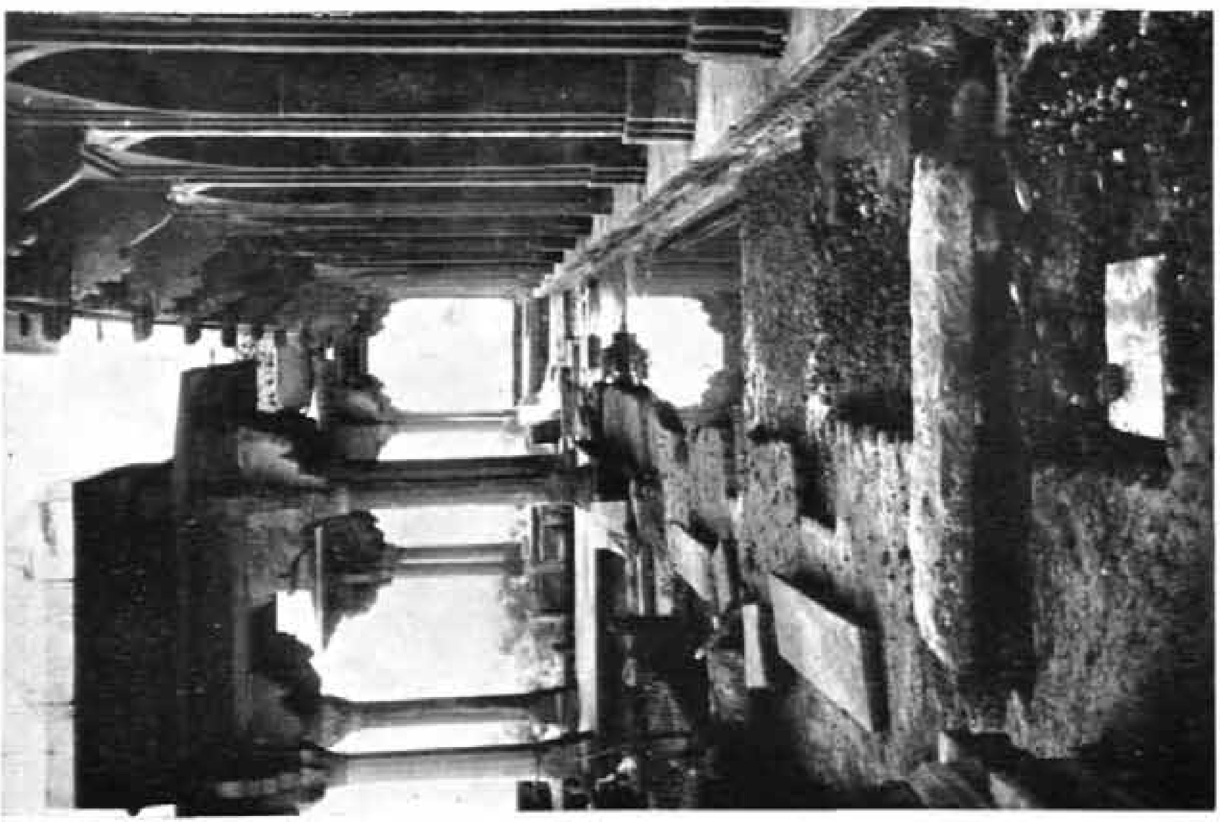


B

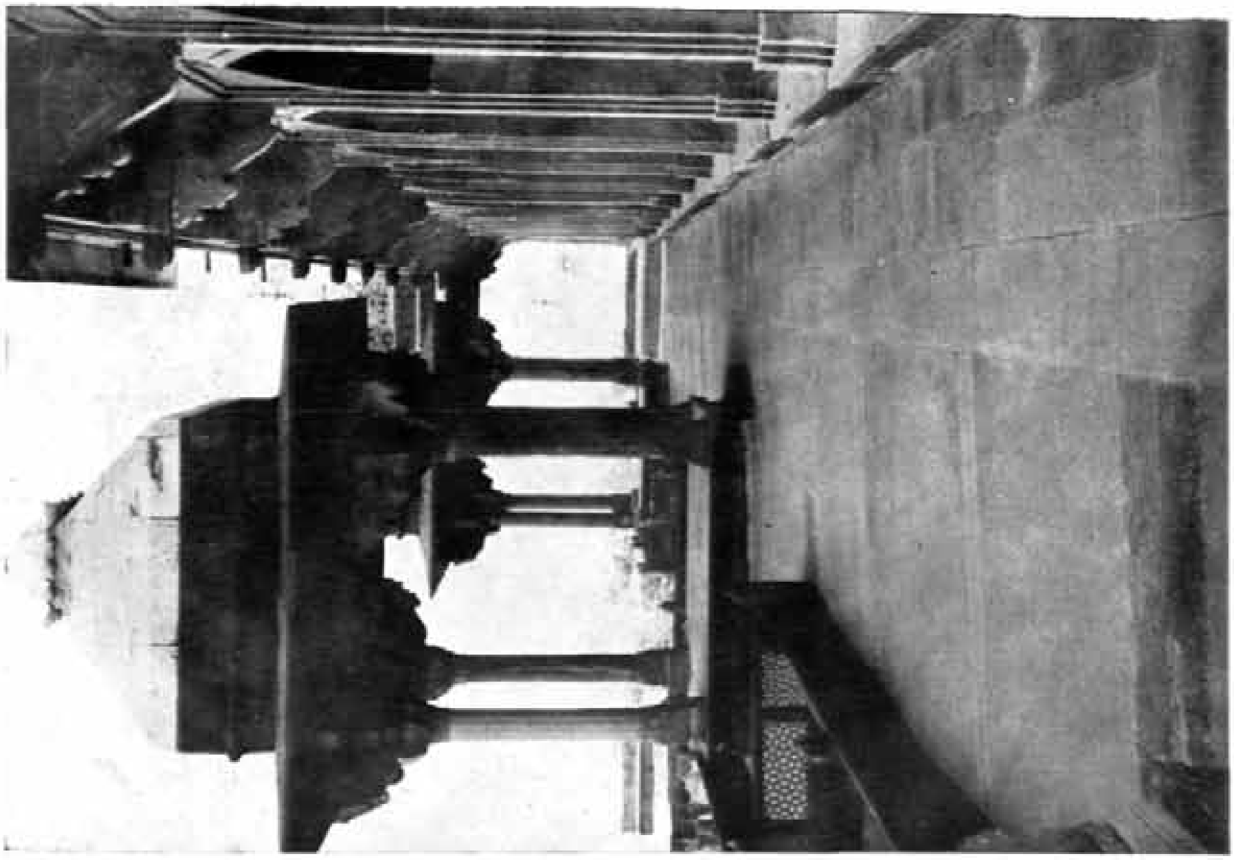


A

Fatehpur Sikri, bastion of fort : A, before and B, after conservation. See p. 111



A



B

Sikandra, Akbar's tomb: A, *before and* B, *after conservation.* *See p. 111*

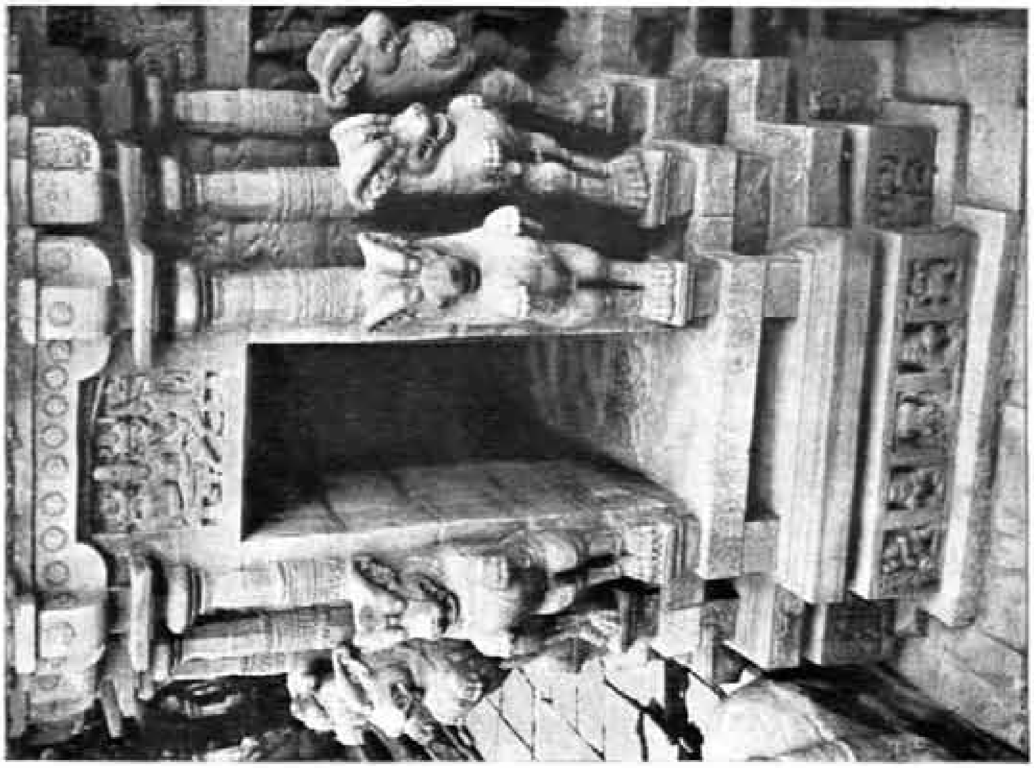


A



B

Bahour, Moolanathaswamy temple : A, *before and* B, *after conservation.* *See p. 114*



B



A

Kanchipuram, Kailasanatha temple: A, *before and* B, *after conservation.* *See p. 114*



A



B

Kanchipuram, Kailasanatha temple : A, *before and* B, *after removal of plaster.* *See p. 114*

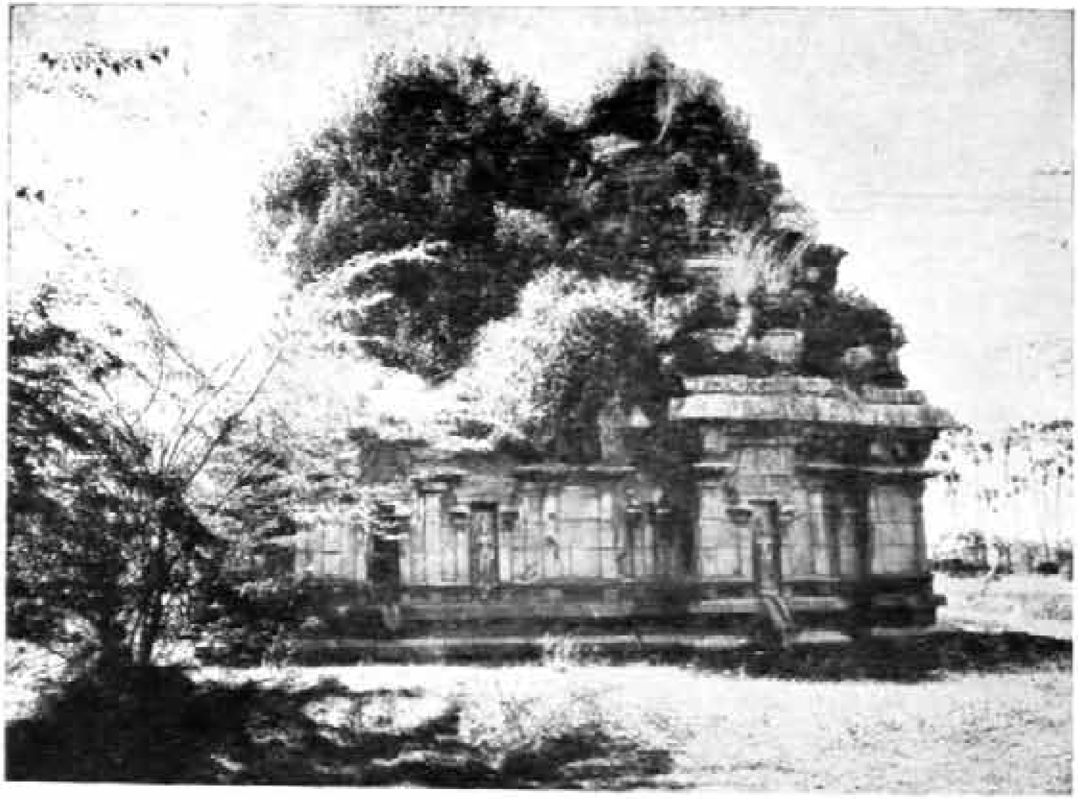


B



A

Mahabalipuram, Shore temple : A, before and B, after conservation. *See p. 115*



A



B

Tenneri, Kanthalingesvara temple : A, *before and* B, *after conservation.* *See p. 115*

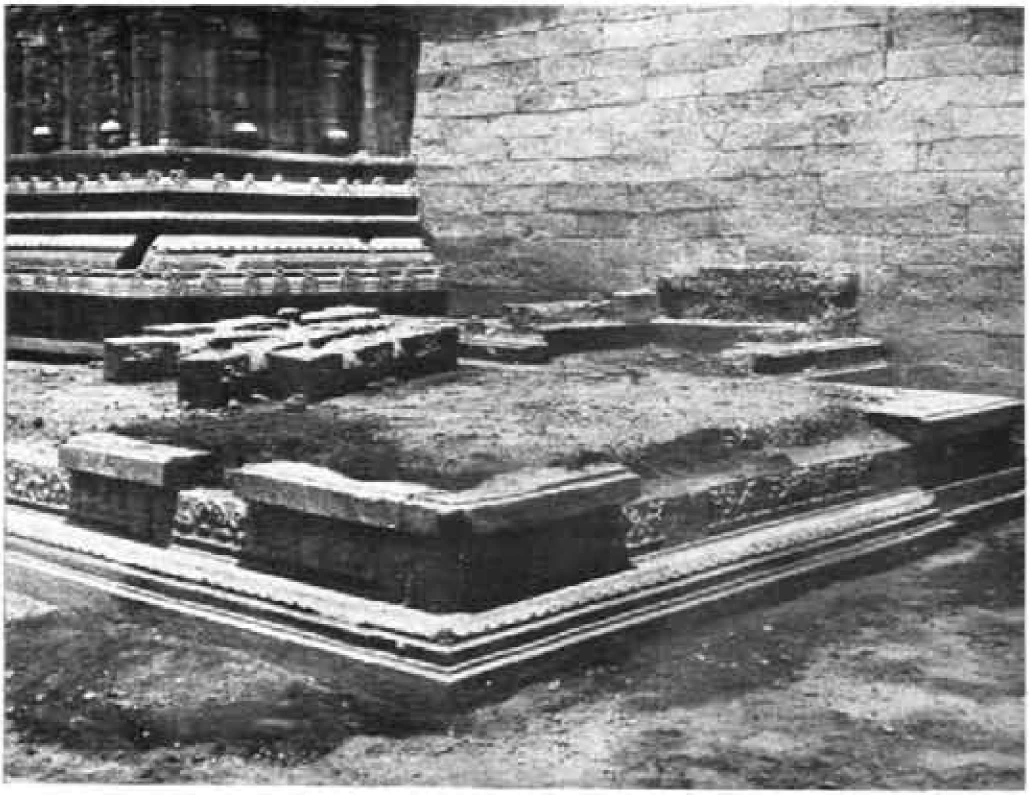


A

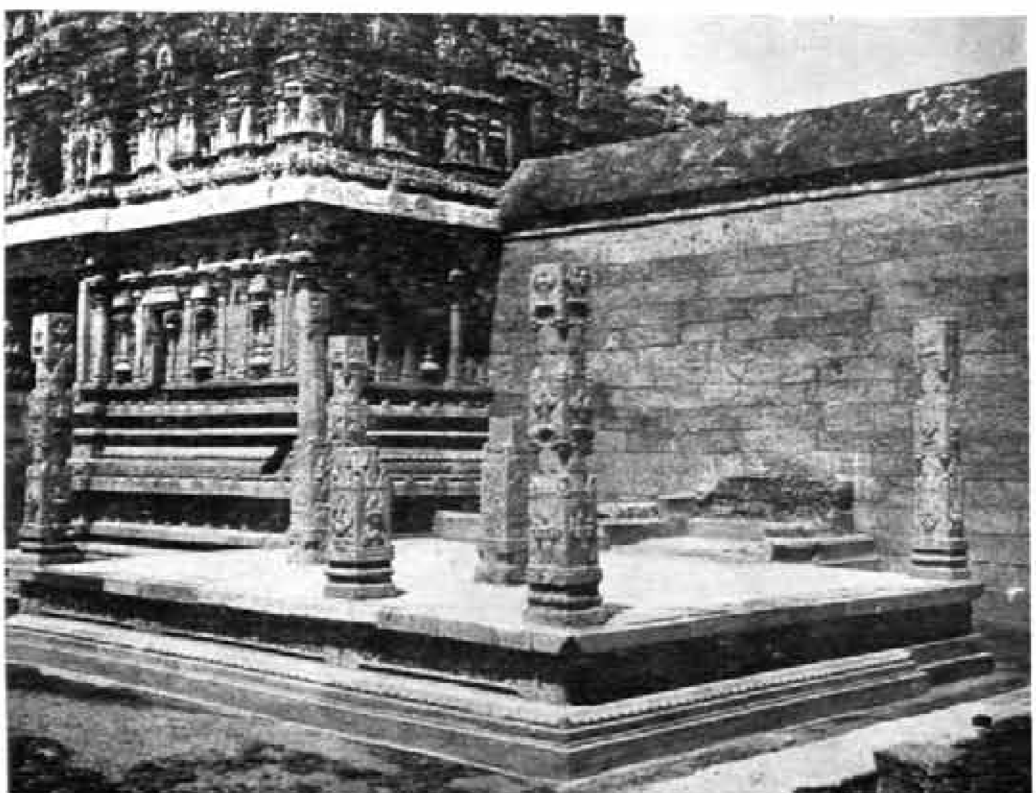


B

Gingee, Venkataramana temple : A, *before and* B, *after conservation.* *See p. 118*



A

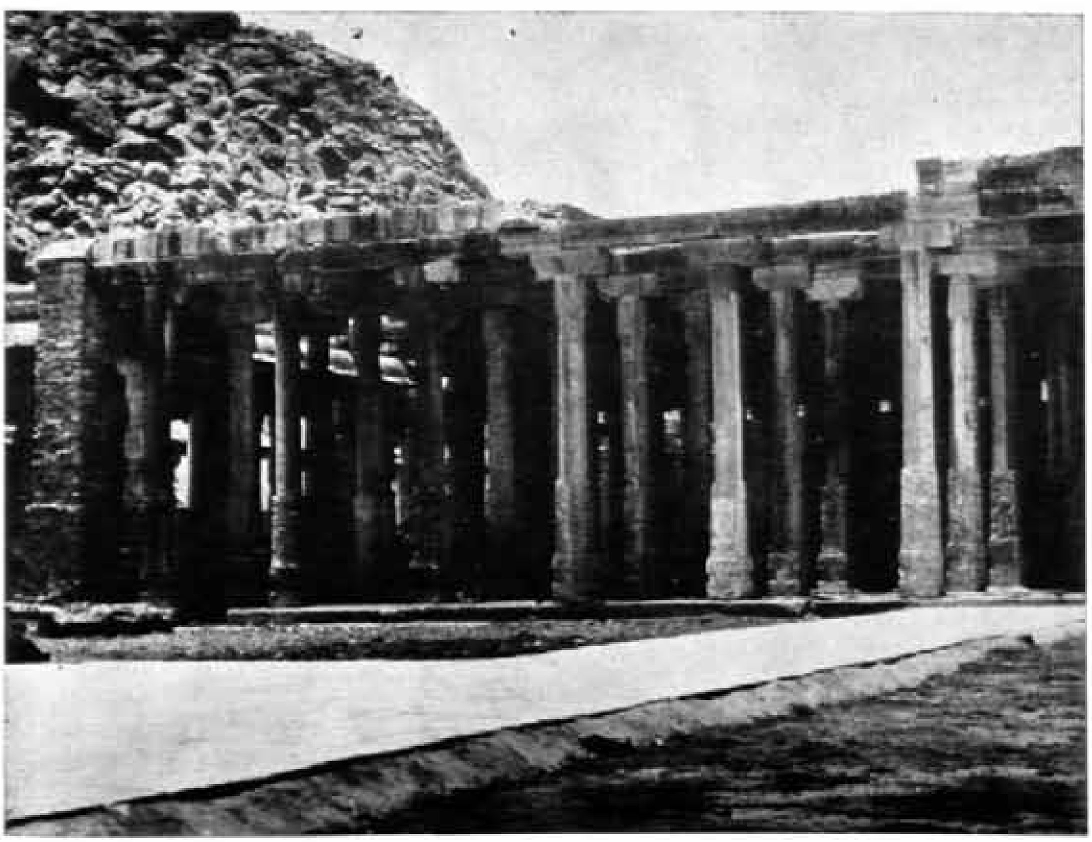


B

Gingee, Venkataramana temple : A, *before and* B, *after conservation. See p. 118*

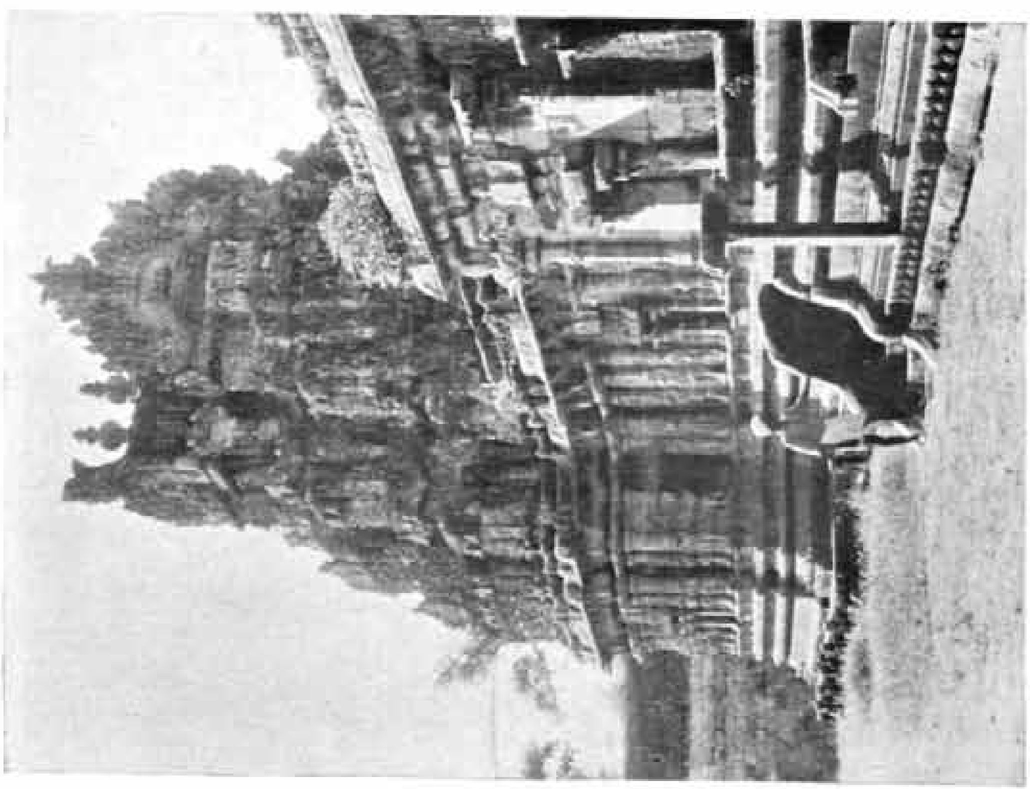


A

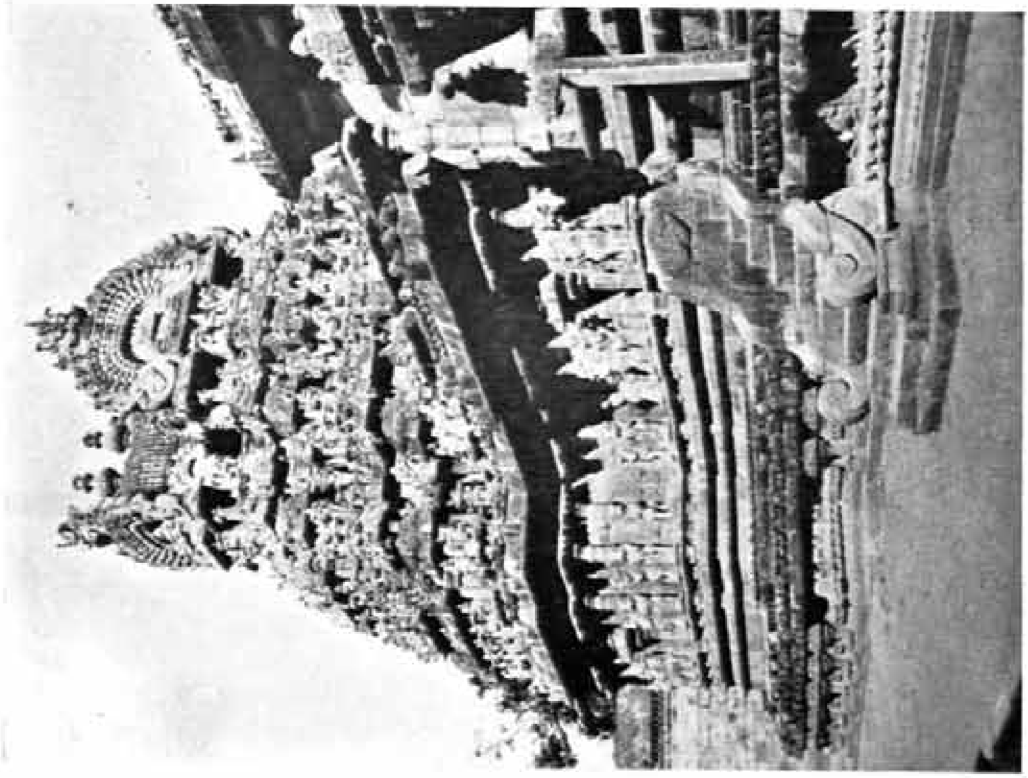


B

Gingee, Venkataramana temple : A, *before and* B, *after conservation.* *See p. 118*

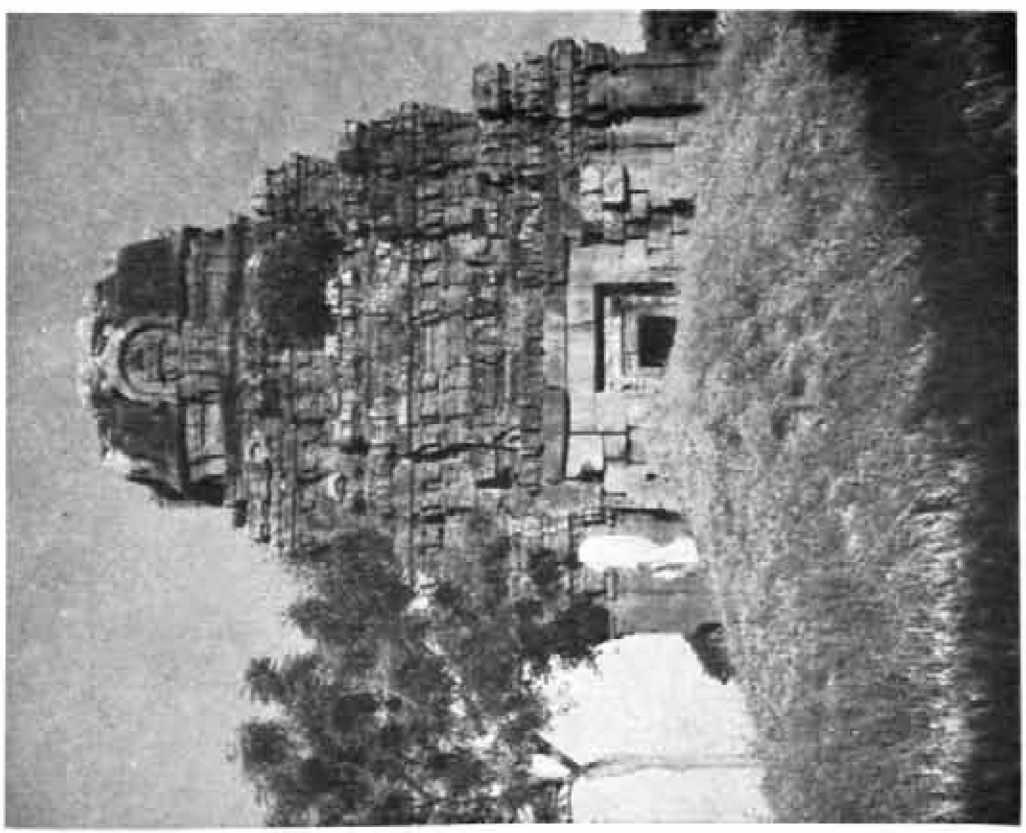


A

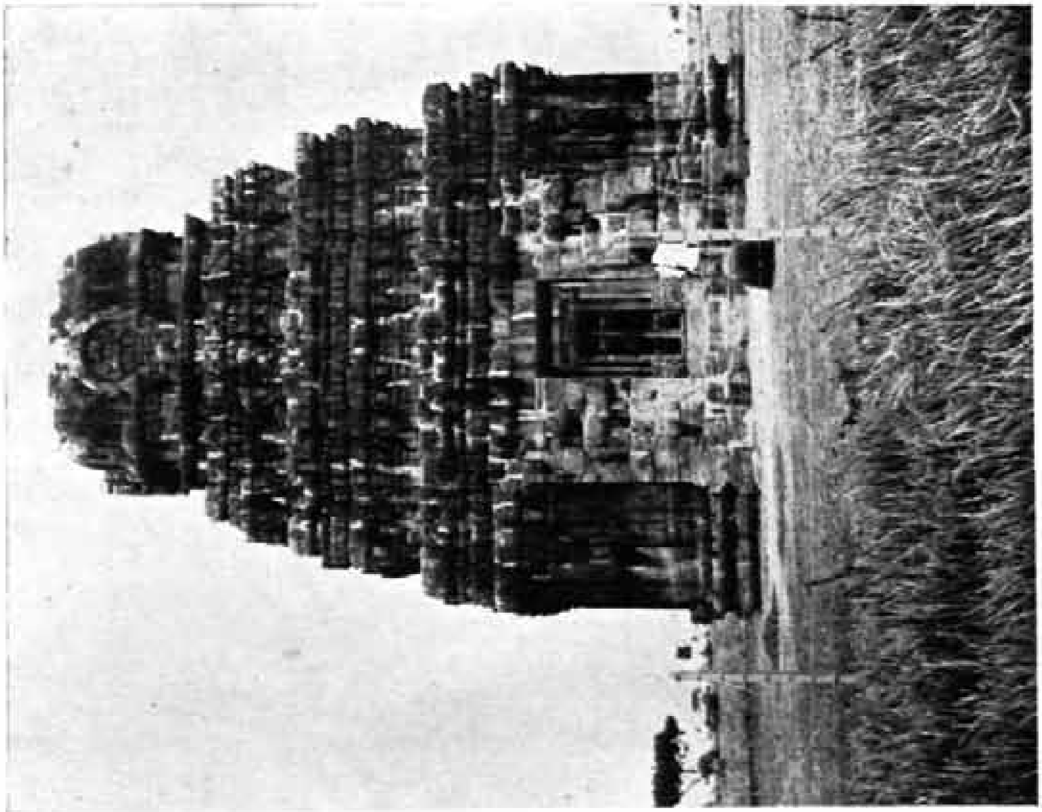


B

Darasuram, Devanayaki Amman shrine : A, *before and* B, *after conservation.* *See p. 119*



A

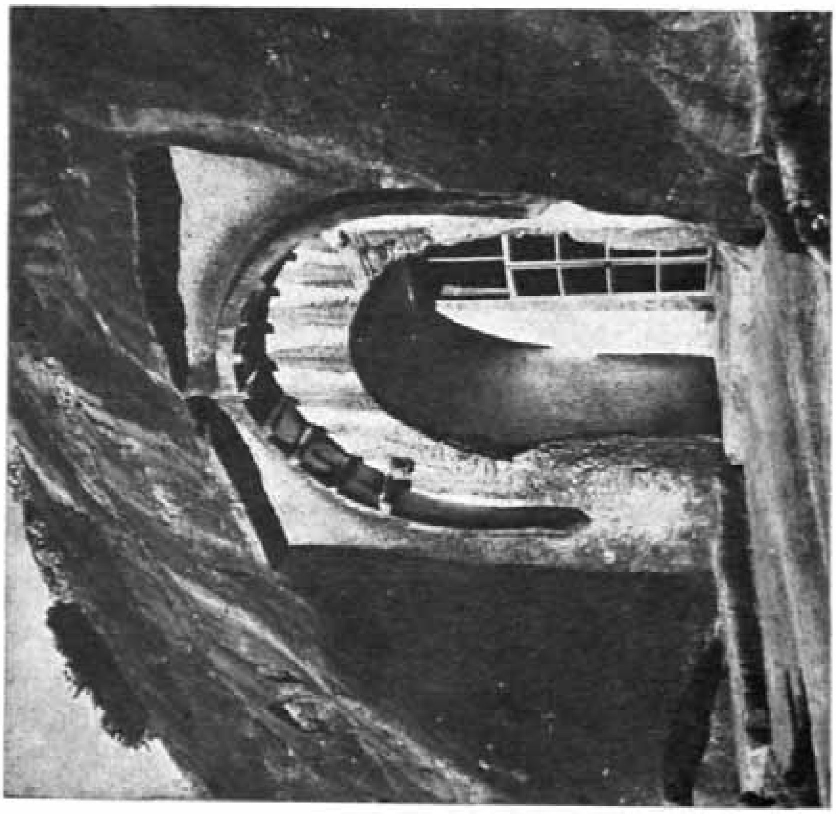


B

Biccavolu, Kancharagudi temple : A, *before and* B, *after conservation.* *See p. 121*



A

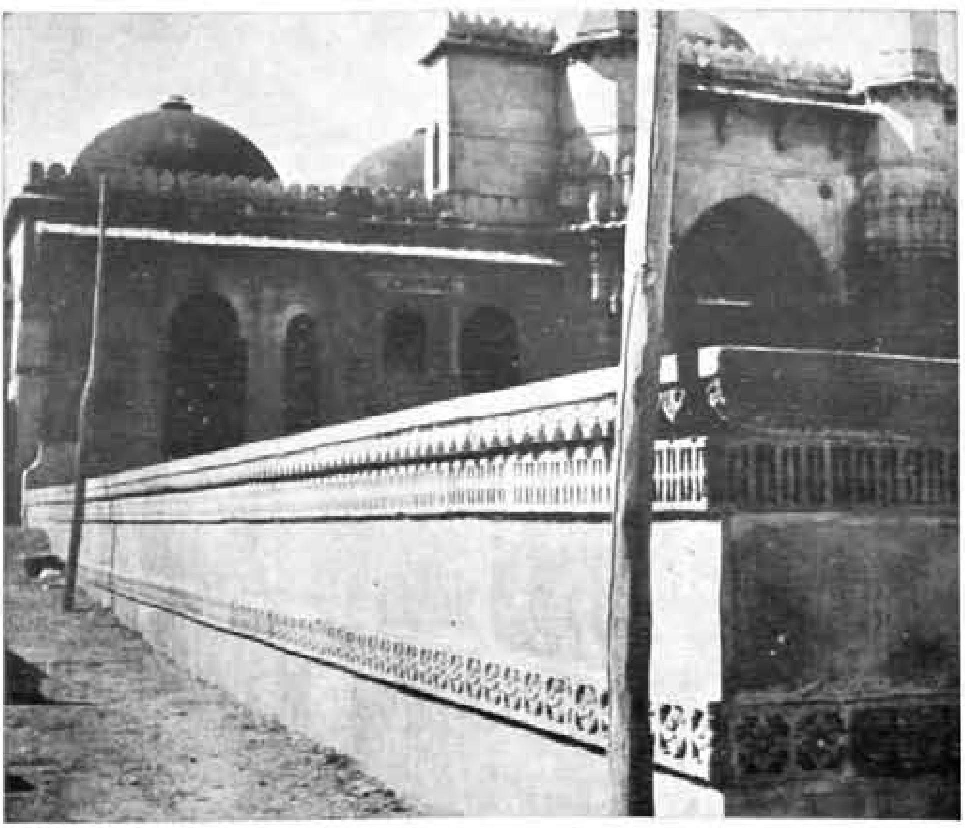


B

Guntupalli, Dharmalingesvara cave : A, *before and* B, *after conservation.* *See p. 122*

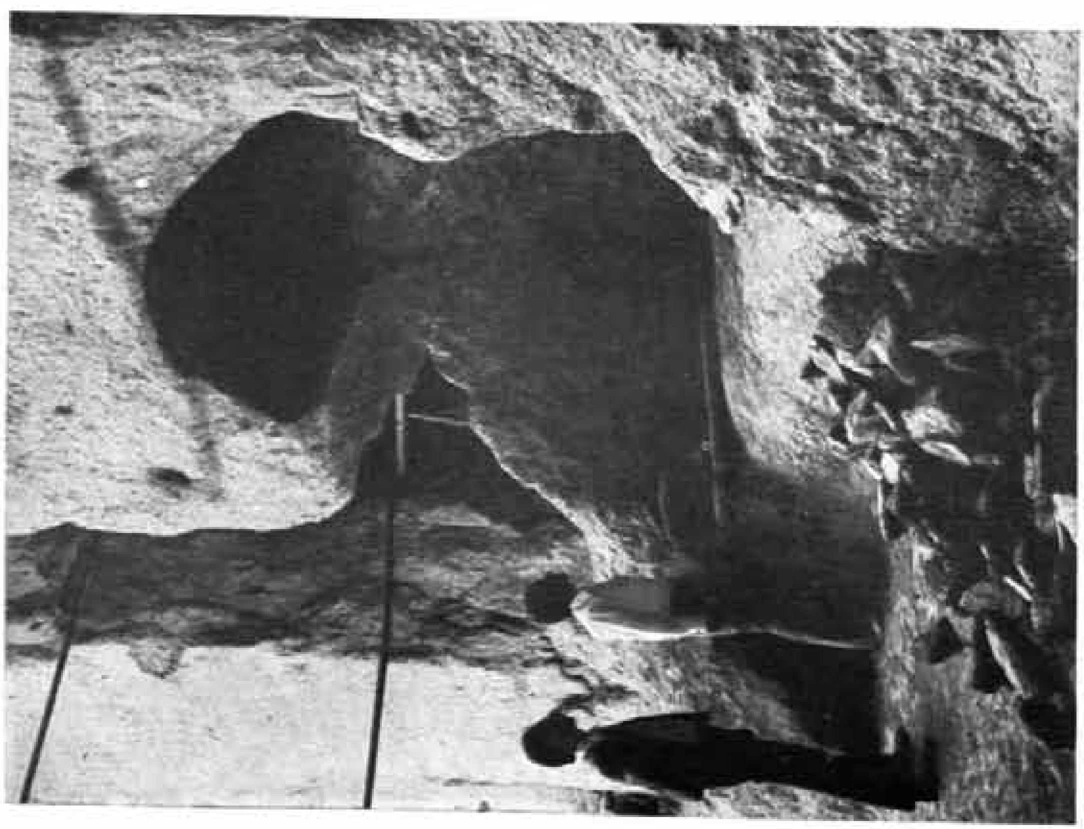


A

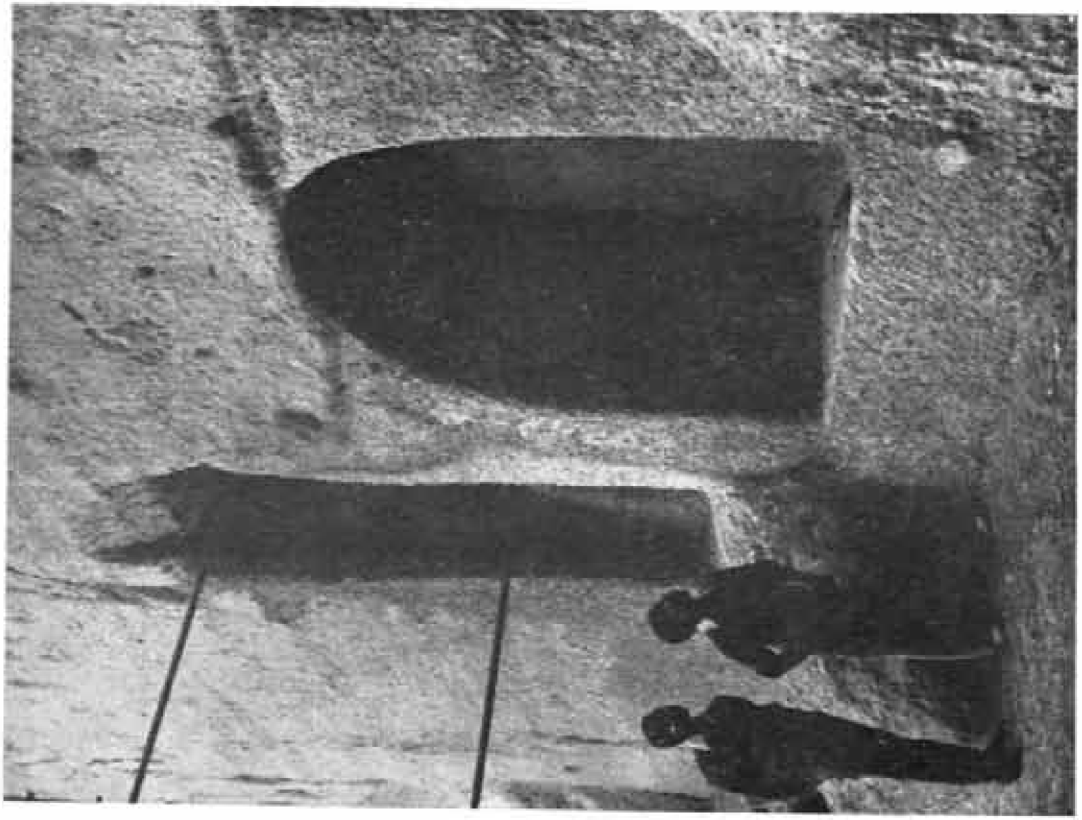


B

Ahmadabad (Asarwa), Bai Harir's Vav : A, *before and* B, *after conservation.* *See p. 125*

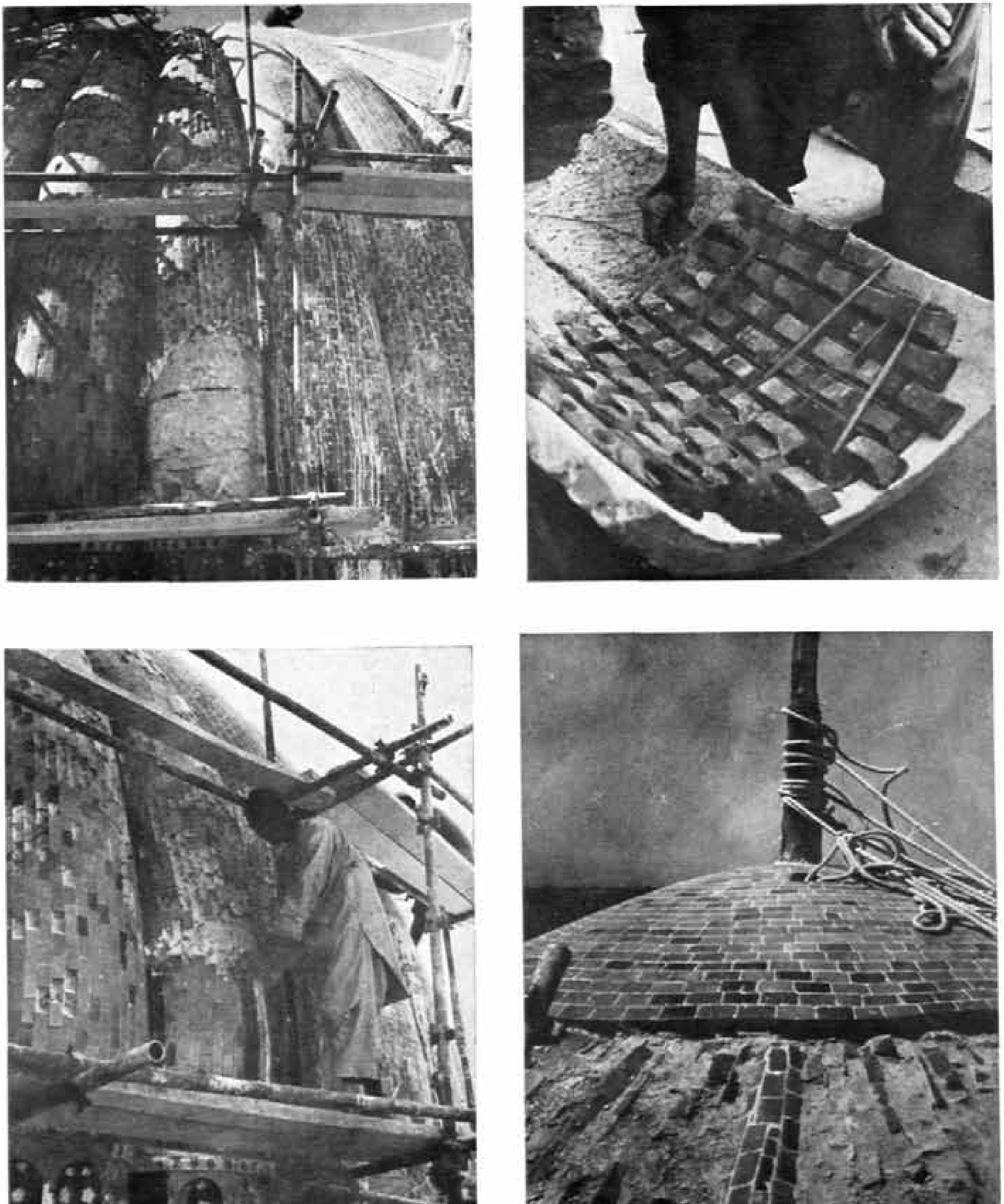


A



B

Bamiyan, Afghanistan : shrine around principal niche near Big Buddha,
A, before and B, after conservation. *See p. 131*



A B C D

Balkh, Afghanisthan : shrine of Khwaja Abu Nasar Parsa,
A, *before and* B, C, D, *during conservation.* *See p. 131*

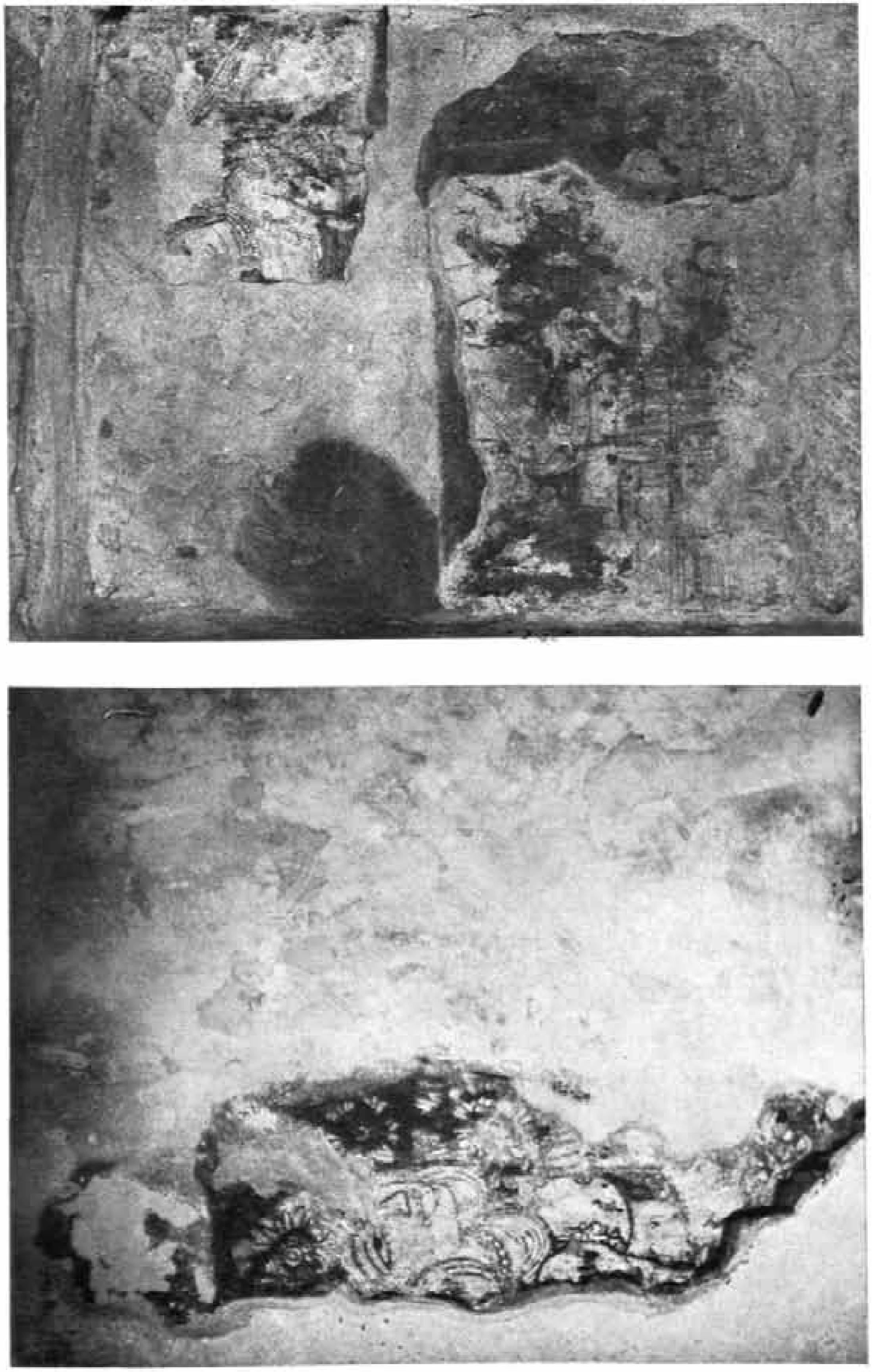


A



B

Hanamkonda, Thousand pillared temple : A, *before and* B, *after chemical treatment.* *See p. 133*

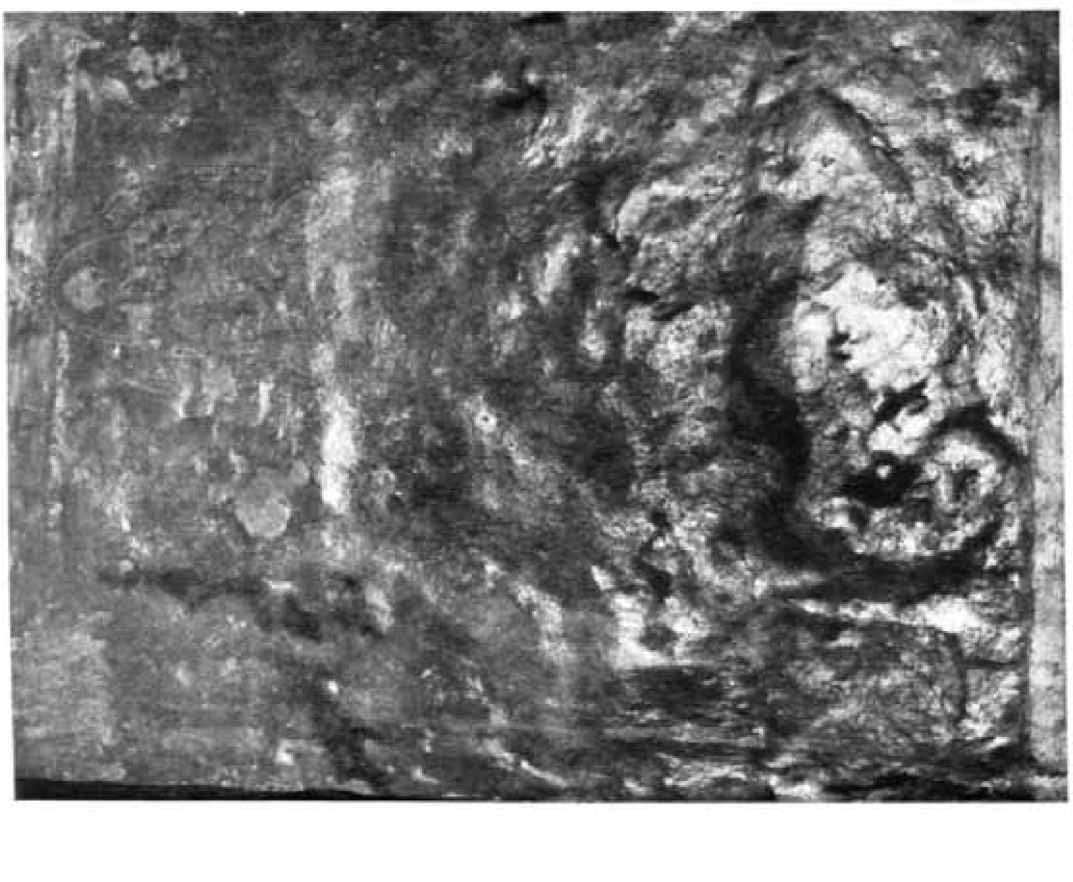


A B

Ajanta, Cave 6 : painted panels during chemical treatment. *See p. 137*



B



A

Ellora, Kailasa temple : painted panel, A, before and B, after chemical treatment. *See p. 138*